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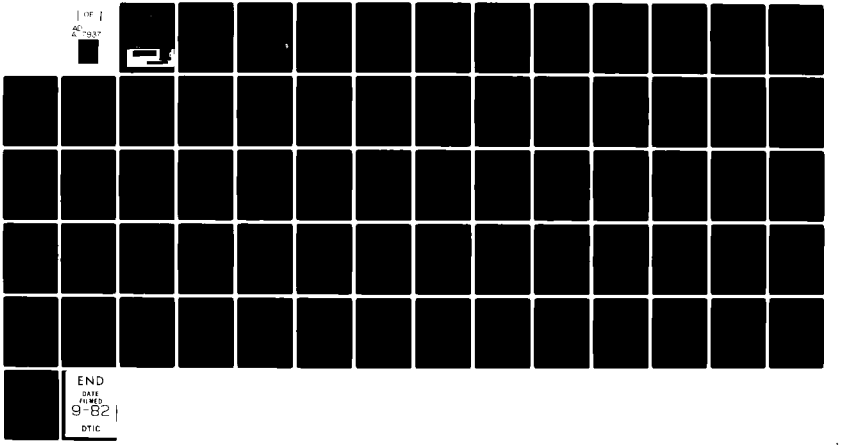

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DEVELOPMENT OF MAINTENANCE-CRITICAL SYSTEMS AND EQUIPMENTS LISTS FOR FFG-1 AND FF-1040 CLASS SHIPS

May 1982

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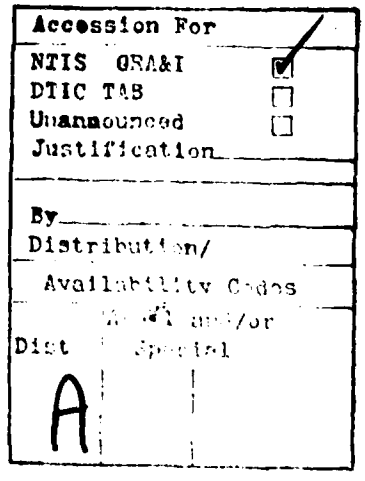

ABSTRACT

This document presents lists, in SWAB order, of the maintenance-critical systems and equipments installed on FFG-1 and FF-1040 Class ships.

SUMMARY

This report presents the results of analyses performed to identify maintenance-critical systems and equipments on FFG-1 and FF-1040 Class ships. Maintenance-critical systems are those systems which have contributed significantly to the maintenance burden of ships of the class; maintenance-critical equipments are those equipments within maintenance-critical systems which have contributed significantly to the systems' maintenance burdens. The objective of this study is to establish areas of concentration for future engineering efforts.

The data analyzed were obtained for ship's force and intermediate maintenance activity (IMA) maintenance experience as reported in the maintenance data system (MDS) and casualty reports (CASREPs). The PERA (CD) Working Repair Profile Ship Alteration and Repair Package (SARP) was reviewed to determine which of the systems identified as maintenance-critical by MDS or CASREP data required repetitive repairs or overhauls during regular overhauls.

The study identified 103 systems on FFG-1 Class ships and 106 systems on FF-1040 Class ships as being maintenance-critical. These systems accounted for a substantial majority of the total reported job control numbers (JCNs), ship's force and IMA man-hours, parts costs, and CASREPs for all systems and equipments installed on those ships.

The results of this study should be used as a basis for selecting ship systems for in-depth analyses directed toward improving maintenance strategies and system reliability and maintainability.

CONTENTS

CHAPTER ONE

INTRODUCTION

This report lists ship systems and equipments on FFG-1 and FF-1040 Class ships that have been determined to be maintenance-critical. The lists are based on analyses of historical maintenance data and are intended to be used as a guide for directing future engineering activity for these classes.

The lists of maintenance-critical systems and equipments were compiled on the basis of the following historical information:

- Maintenance burden in terms of job control numbers (JCNs) (maintenance actions), man-hours, and parts costs accumulated during normal operating periods
- Number of casualty reports (CASREPs) submitted
- Repair history during regular overhauls

The lists reflect the identified maintenance-critical systems and equipments for the entire ship, ranked by experienced maintenance burden, and provide a basis for prioritizing subsequent engineering analyses. The reasons why systems and equipments have significant maintenance burdens were not investigated.

Chapter Two of this report documents the approach used in preparing the maintenance-critical systems and equipments lists, which are included in the appendix; Chapter Three summarizes the results; and Chapter Four presents the conclusions and recommendations. The appendix to this report also provides quantitative and qualitative information on the observed maintenance burdens of maintenance-critical systems and equipments on FFG-1 and FF-1040 Class ships.

CHAPTER TWO

APPROACH

2.1 INTRODUCTION

The development of maintenance-critical systems and equipments lists was divided into four steps. The first step was to identify the systems to be included in the lists. The second was to prioritize the lists in order of the most significant maintenance burdens and prepare preliminary maintenance-critical systems lists for each ship. Step three was to identify the equipments that contributed significantly to the related system's maintenance burden. The fourth step was to select systems that should be subjected to detailed analysis. The four steps are described in the following sections.

Separate lists were prepared for each ship; those lists are presented in the appendix. The mission criticality of maintenance-critical systems was evaluated to define candidates for detailed analysis.

2.2 IDENTIFICATION OF MAINTENANCE-CRITICAL SYSTEMS

Identification of the maintenance-critical systems resulted from the review and analyses of the following three independent data sources:

- Maintenance data system (MDS) data
- CASREP data
- Working Repair Profile Ship Alteration and Repair Package (SARP) data

The following subsections describe how each data source was used in the identification of maintenance-critical systems.

2.2.1 MDS Data

Raw MDS maintenance transaction data from January 1978 through December 1981 were acquired from the Navy Maintenance Support Office (NAMSO), Mechanicsburg, Pennsylvania, on computer tape and sorted into Ship Work Authorization Boundary (SWAB) sequence. The data were analyzed to identify system maintenance burdens.

The following MDS data categories were used:

- JCNs
- Parts dollars
- Total man-hours (ship's force and intermediate maintenance activity man-hours)

The number of maintenance actions, represented by the number of JCNs, was used to indicate the frequency of maintenance. The parts dollars were used to indicate the costs of parts used in system maintenance. The ship's force man-hours and intermediate maintenance activity (IMA) man-hours were used to show the effort required to maintain systems at both levels of maintenance.

If the MDS data reported against a SWAB in any of the three categories met a threshold value that was significant in relation to the entire data base, then the system represented was designated a maintenance-critical system. The significance threshold selected was one-half of one percent of the data base total for each category.

2.2.2 CASREP Data

CASREPs were chosen as a data source because the maintenance necessary to correct a CASREP represents a maintenance burden that is required by a ship to fulfill its operational commitments. Specific identification of this information is not contained in the MDS. CASREP summaries were obtained from the Ships Parts Control Center (SPCC), Mechanicsburg, Pennsylvania, for the two ship classes for the period January 1979 through December 1981. The data were used to identify the systems that had recurring malfunctions (as indicated by the number of CASREPs submitted), which affected the operational commitments of each ship. The threshold value chosen for significance was one or more CASREPs per ship operating year.

2.2.3 Overhaul Data

The PERA (CD) Working Repair Profile SARP was reviewed to determine which of the systems identified as being maintenance-critical by MDS or CASREP data required repetitive repair or overhauls during regular overhauls. The Working Repair Profile SARP specifies those systems and equipments that have been identified by PERA (CD) as being common to 9 of the 17 SARPs reviewed for the FFG-1 and FF-1040 Class ships. Review of that document identified those systems and equipments which required repetitive repairs during regular overhauls.

2.3 RANKING OF MAINTENANCE-CRITICAL SYSTEMS

After the maintenance burdens were calculated for each maintenance-critical system, the systems were divided into four lists by data category: JCNs, parts costs, total man-hours, and CASREPs. The systems were ranked in descending order on each list.

To arrive at a final ranking of maintenance-critical systems, it was necessary to develop a method of logically combining the four separate rankings into a single consolidated list. The algorithm selected assumes that each of the four categories previously ranked are of equal importance in defining the final ranking of maintenance-critical systems. To the extent that this assumption is in error, the final composite ranking is imprecise. However, we are confident that the error introduced by this assumption does not have a significant impact on the validity of the final ranking.

To obtain this final ranking, the relative standings of the systems from each of the four sources were summed. The resultant sum was the maintenance burden factor (MBF). This is expressed symbolically as:

$$MBF_i = MH_i + PC_i + JCN_i + C_i$$

where

MBF_i = maintenance burden factor for the i^{th} system

MH_i = Rank of the i^{th} system by man-hours

PC_i = Rank of the i^{th} system by reported parts costs

JCN_i = Rank of the i^{th} system by JCNs

C_i = Rank of the i^{th} system by number of CASREPs

Since the system with the lowest MBF represents the highest maintenance burden, the maintenance-critical systems were ranked by ascending MBF, as illustrated in Table 2-1. The method used to rank the maintenance-critical system was developed to permit equal weighting of the four categories (JCNs, man-hours, parts costs, and CASREPs).

Table 2-1. EXAMPLE OF RANKING BY ASCENDING MAINTENANCE BURDEN FACTOR (MBF)

SWAB	System	JCNs	Man-Hours	Parts Costs	CASREPs	MBF	MBF Rank
110-1	A	2	1	4	2	9	1
105-3	B	1	9	2	1	13	2
329-4	C	4	16	1	5	26	3
350-2	D	5	4	9	10	28	4
400-4	E	7	15	6	12	40	5

2.4 IDENTIFICATION OF EQUIPMENTS CONTRIBUTING TO SYSTEM MAN-HOURS

After the maintenance-critical systems were identified, it was necessary to identify which equipments within the maintenance-critical systems contributed most to the maintenance burdens of their respective systems. This was accomplished in two steps and identified those equipments whose aggregate man-hour burdens were at least 90 percent of each system's burden.

2.4.1 Identification of Maintenance-Critical Equipments

A computer program was used that sorted the SWAB-ordered MDS data and ranked, by total man-hours, the Allowance Parts List numbers (APLs) reporting data against each SWAB. The program then printed out the APLs whose aggregate man-hour burdens were at least 90 percent of the SWAB man-hours for each SWAB. The equipments represented by the APLs were designated as being maintenance-critical, unless the APLs reported were "NOT LISTED," "UNKNOWN," or something similar. In these cases, the burden was considered to be reported at the system or SWAB level and not against specific identified equipments within those systems.

2.4.2 Identification of Equipment Configuration

After the APLs for the maintenance-critical equipments were defined, the equipments represented by the APLs were identified and listed. This configuration summary was prepared following review of the Surface Ship Type Commander's (TYCOM's) Coordinated Shipboard Allowance Lists (COSALs) for both the Atlantic and Pacific fleets. Because some systems have equipments that do not have APL numbers (e.g., platforms, flats, and decks), it was not always possible to identify the specific equipments that contributed most to the maintenance burdens of the respective maintenance-critical systems. In addition, correlation of summarized maintenance burden data to specific equipments where APLs were reported as "NOT LISTED" or "UNKNOWN" was also not possible.

A series of lists was prepared for each ship class of the maintenance-critical systems and its respective maintenance burdens. Additional lists of the maintenance-critical systems and equipments were also prepared. All systems were listed in SWAB order. In the maintenance-critical equipment tables the APLs were listed in descending order by reported man-hours. For systems where the maintenance burden is reported at the system level or where APL identification was not possible, no APLs were listed. These lists defined the maintenance-critical systems and equipments.

2.5 SELECTION OF SYSTEMS THAT SHOULD BE SUBJECTED TO DETAILED ANALYSIS

Systems that were mission-critical -- in addition to being maintenance-critical -- were also identified. OPNAVINST C3501.2E (19 October 1977) was reviewed to identify the ships' primary mission areas. The functions of maintenance-critical systems were then compared to these mission areas. If the function of a maintenance-critical system was judged to be required for fulfillment of a primary mission, the system was considered to be

mission-critical. Tables were then prepared to list those systems on each ship which were both maintenance- and mission-critical and thus the most appropriate candidates for detailed analysis.

CHAPTER THREE

RESULTS

3.1 MAINTENANCE-CRITICAL SYSTEMS AND EQUIPMENTS

As a result of the review and analysis of MDS and CASREP data, 103 systems on FFG-1 Class ships and 106 systems on FF-1040 Class ships were identified as being maintenance-critical. The appendix lists each of the identified systems in SWAB order and the equipments within each of the identified systems (when equipment identification was possible) that are also maintenance-critical. Included in the lists are the relative rankings of each system within each data category that led to the final MBF rankings.

3.2 PORTION OF CLASS MAINTENANCE BURDEN CONTRIBUTED BY MAINTENANCE-CRITICAL SYSTEMS AND EQUIPMENTS

The maintenance-critical systems and equipments identified by this analysis account for a substantial majority of the total reported maintenance burdens for each ship. The combined burdens for the maintenance-critical systems on FFG-1 Class ships account for about 87 percent of the JCNs, 83 percent of the total reported ship's force and IMA man-hours, 87 percent of the reported parts costs, and 99 percent of the CASREPs. For FF-1040 Class ships the combined burdens account for 86 percent of the JCNs, 84 percent of the total reported ship's force and IMA man-hours, 86 percent of the reported parts costs, and 98 percent of the CASREPs. The remaining maintenance burden is distributed over a wide range of systems and equipments that failed to meet the previously defined selection criteria for maintenance-critical systems and equipments. Thirty-eight percent of the systems on FFG-1 Class ships and 37 percent of the systems on FF-1040 Class ships were determined to be critical to one or more primary mission areas.

3.3 SYSTEMS IDENTIFIED AS BEING MAINTENANCE- AND MISSION-CRITICAL

Thirty-nine systems on FFG-1 Class ships and 39 systems on FF-1040 Class ships were identified from the analysis as being both maintenance- and mission-critical. Tables 3-1 and 3-2 list the SWAB, system nomenclature, MBF, and MBF rank for those systems on FFG-1 Class ships and FF-1040

Table 3-1. FFG-1 CLASS MAINTENANCE- AND MISSION-CRITICAL SYSTEMS IN SWAB ORDER

SWAB	System Nomenclature	MBF	MBF Rank	SWAB	System Nomenclature	MBF	MBF Rank
110-1	Underwater body hull	264	82	440-3	Quality monitoring and control	265	83
221-1	Propulsion boilers	9	1	441-1	Communication antenna systems	200	58
231-1	Propulsion steam turbines	177	50	441-3	Communication transmitters	130	33
241-1	Propulsion reduction gears	303	97	441-4	Communication receivers	102	21
243-1	Propulsion shafting	221	64	441-5	Communication transceivers	65	12
253-1	Main steam piping	129	30	445-1	Teletype and facsimile	92	17
254-1	Main condensers and air ejectors	234	69	450-1	Radar distribution systems	97	18
255-1	Feed and condensate	31	5	451-X	Surface search radars	191	56
262-1	Main lube oil piping	132	34	452-X	2D air search radars	35	8
311-1	SSTGs	32	6	455-1	IFF	165	46
312-1	Emergency generator sets	289	93	460-X	Sonar systems	28	4
314-1	Power conversion equipment	183	53	471-1	Active ECM	191	57
320-1	Power cable	182	51	472-1	Passive ECM	122	27
411-1	Tactical data displays	319	100	481-X	Gun fire control systems	54	10
412-1	Tactical data processing	284	91	482-X	Missile fire control systems	13	2
423-1	Electronic navigation	244	76	483-X	ASW fire control systems	168	48
426-1	Gyrocompass	157	43	520-1/ 521-1	Sea valves/fire and flushing	27	3
426-2	Electrical navigation	122	26				
437-1	Indicating, order, and metering	184	54	711-1	Guns and mounts	87	15
440-2	Satellite communications	173	49	721-1	Missile launching systems	35	7

Table 3-2. FF-1040 CLASS MAINTENANCE- AND MISSION-CRITICAL SYSTEMS IN SWAB ORDER

SWAB	System Nomenclature	MBF	MBF Rank	SWAB	System Nomenclature	MBF	MBF Rank
110-1	Underwater body hull	290	87	440-3	Quality monitoring and control	306	96
221-1	Propulsion boilers	7	1	441-1	Communication antenna systems	222	63
231-1	Propulsion steam turbines	178	50	441-3	Communication transmitters	111	22
241-1	Propulsion reduction gears	248	75	441-4	Communication receivers	82	14
243-1	Propulsion shafting	263	80	441-5	Communication transceivers	53	9
252-1	Automatic propulsion controls	294	89	445-1	Teletype and facsimile	108	19
253-1	Main steam piping	74	12	450-1	Radar distribution systems	135	32
254-1	Main condensers and air ejectors	298	91	451-X	Surface search radars	193	53
255-1	Feed and condensate	20	3	452-X	2D air search radars	117	23
262-1	Main lube oil piping	139	33	455-1	IFF	210	60
311-1	SSTGs	43	5	460-X	Sonar systems	14	2
312-1	Emergency generator sets	210	59	471-1	Active ECM	215	61
314-1	Power conversion equipment	230	68	472-1	Passive ECM	127	28
320-1	Power cable	198	54	481-X	Gun fire control systems	43	7
411-1	Tactical data displays	218	62	482-X	Missile fire control systems	319	98
423-1	Electronic navigation	169	46	483-X	ASW fire control systems	161	42
426-1	Gyrocompass	150	37	520-1/ 521-1	Sea valves/fire and flushing	27	4
426-2	Electrical navigation	109	21				
437-1	Indicating, order, and metering	167	44	711-1	Guns and mounts	47	8
440-2	Satellite communications	168	45	721-1	Missile launching systems	130	30

Class ships, respectively, in SWAB order. All systems listed were determined to be critical to one or more primary mission areas (mobility; command, control, and communications; electronic warfare) from the results of a review of OPNAVINST C3501.2E (19 October 1977). Tables 3-3 and 3-4 present the same information in MBF rank order.

Table 3-3. FFG-1 CLASS MAINTENANCE- AND MISSION-CRITICAL SYSTEMS IN MBF RANK ORDER

SWAB	System Nomenclature	MBF	MBF Rank	SWAB	System Nomenclature	MBF	MBF Rank
221-1	Propulsion boilers	9	1	426-1	Gyrocompass	157	43
482-X	Missile fire control systems	13	2	455-1	IFF	165	46
520-1/ 521-1	Sea valves/fire and flushing	27	3	483-X	ASW fire control systems	168	48
460-X	Sonar systems	28	4	440-2	Satellite communications	173	49
255-1	Feed and condensate	31	5	231-1	Propulsion steam turbines	177	50
311-1	SSTGs	32	6	320-1	Power cable	182	51
721-1	Missile launching systems	35	7	314-1	Power conversion equipment	183	53
452-X	2D air search radars	35	8	437-1	Indicating, order, and metering	184	54
481-X	Gun fire control systems	54	10	451-X	Surface search radars	191	56
441-5	Communication transceivers	65	12	471-1	Active ECM	191	57
711-1	Guns and mounts	87	15	441-1	Communication antenna systems	200	58
445-1	Teletype and facsimile	92	17	243-1	Propulsion shafting	221	64
450-1	Radar distribution systems	97	18	254-1	Main condensers and air ejectors	234	69
441-4	Communication receivers	102	21	423-1	Electronic navigation	244	76
426-2	Electrical navigation	122	26	110-1	Underwater body hull	264	82
472-1	Passive ECM	122	27	440-3	Quality monitoring and control	265	83
253-1	Main steam piping	129	30	412-1	Tactical data processing	284	91
441-3	Communication transmitters	130	33	312-1	Emergency generator sets	289	93
262-1	Main lube oil piping	132	34	241-1	Propulsion reduction gears	303	97
				411-1	Tactical data displays	319	100

Table 3-4. FF-1040 CLASS MAINTENANCE- AND MISSION-CRITICAL SYSTEMS IN MBF RANK ORDER

SWAB	System Nomenclature	MBF	MBF Rank	SWAB	System Nomenclature	MBF	MBF Rank
221-1	Propulsion boilers	7	1	483-X	ASW fire control systems	161	42
460-X	Sonar systems	14	2	437-1	Indicating, order, and metering	167	44
255-1	Feed and condensate	20	3	440-2	Satellite communications	168	45
520-1/ 521-1	Sea valves/fire and flushing	27	4	423-1	Electronic navigation	169	46
				231-1	Propulsion steam turbines	178	50
311-1	SSTGs	43	5	451-X	Surface search radars	193	53
481-X	Gun fire control systems	43	7	320-1	Power cable	198	54
711-1	Guns and mounts	47	8	312-1	Emergency generator sets	210	59
441-5	Communication transceivers	53	9	455-1	IFF	210	60
253-1	Main steam piping	74	12	471-1	Active ECM	215	61
441-4	Communication receivers	82	14	411-1	Tactical data displays	218	62
445-1	Teletype and facsimile	108	19	441-1	Communication antenna systems	222	63
426-2	Electrical navigation	109	21	314-1	Power conversion equipment	230	68
441-3	Communication transmitters	111	22	241-1	Propulsion reduction gears	248	75
452-X	2D air search radars	117	23	243-1	Propulsion shafting	263	80
472-1	Passive ECM	127	28	110-1	Underwater body hull	290	87
721-1	Missile launching systems	130	30	252-1	Automatic propulsion controls	294	89
450-1	Radar distribution systems	135	32	254-1	Main condensers and air ejectors	298	91
262-1	Main lube oil piping	139	33	440-3	Quality monitoring and control	306	96
426-1	Gyrocompass	150	37	482-X	Missile fire control systems	319	98

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

The analysis presented in this report resulted in the identification of 103 systems on FFG-1 Class ships and 106 systems on FF-1040 Class ships that have contributed significantly to the maintenance burden of each ship class. As shown by the MDS data, these systems have required considerable expenditure of corrective maintenance resources. The systems have also been the source of virtually all of the CASREPs reported by the classes.

Because this study identifies the most significant contributors to the maintenance burden for the FFG-1 and FF-1040 ship classes, it serves as an essential first step in the development of improved maintenance strategies for these classes of ships. The study results can be used to direct analytical efforts to areas where significant advances can be realized in developing engineered maintenance strategies for systems and equipments that historically have been sources of maintenance problems. Maintenance data reported for highly ranked systems should be reviewed and analyzed in detail to identify specific areas in which improvements can be made to maintenance strategies and reliability and maintainability. These efforts can reduce the overall system maintenance burden and improve the reliability and maintainability of the installed systems.

APPENDIX

MAINTENANCE-CRITICAL SYSTEMS AND EQUIPMENTS LISTS

This appendix presents the maintenance-critical systems and equipments lists for FFG-1 Class ships and FF-1040 Class ships. Tables A-1 and A-2 list the systems in SWAB order. Each list presents summaries of the pertinent data for each system that indicated its maintenance criticality. Tables A-3 and A-4 list the maintenance-critical equipments within the maintenance-critical systems in order of reported man-hours. In these tables, AEL refers to the Allowance Equipage List number.

Table A-1. FFG-1 CLASS MAINTENANCE-CRITICAL SYSTEMS

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
110-1	Underwater body hull	77	60	92	35	264	82	141	1,966	6,131	2	0.2	0.3	0.1	0.1	x	
120-1	Hull structural bulkheads	83	69	93	34	281	88	104	1,570	6,061	3	0.2	0.3	0.0	0.2		
123-1	Tanks	75	50	99	33	257	81	151	2,691	590	4	0.2	0.5	0.0	0.2		x
130-1	Flight and helicopter decks	85	71	96	36	288	92	69	1,388	3,313	1	0.1	0.2	0.0	0.1		
165-1	Sonar domes	66	75	70	34	245	77	226	1,179	24,646	3	0.3	0.2	0.1	0.2		
167-1	Structural closures	26	19	46	37	128	29	699	7,373	46,876	0	1.0	1.3	0.2	0.0		x
221-1	Propulsion boilers	1	1	6	1	9	1	4,022	49,713	667,355	148	5.9	8.6	3.4	9.0	x	x
231-1	Propulsion steam turbines	61	57	34	25	177	50	262	2,240	84,571	13	0.4	0.4	0.4	0.8	x	x
233-1	Main propulsion diesel engines	91	93	82	36	302	96	37	198	13,139	1	0.1	0.0	0.1	0.1		
241-1	Propulsion reduction gears	84	88	97	34	303	97	72	389	2,090	3	0.1	0.1	0.0	0.2	x	
243-1	Propulsion shafting	81	35	74	31	221	64	113	4,288	19,524	6	0.2	0.7	0.1	0.3	x	x
253-1	Main steam piping	31	23	52	23	129	30	671	6,543	41,122	15	1.0	1.1	0.2	0.9	x	x
254-1	Main condensers and air ejectors	72	42	91	29	234	69	172	3,084	7,126	8	0.3	0.5	0.0	0.5	x	
255-1	Feed and condensate	10	4	14	3	31	5	1,588	20,048	241,427	105	2.3	3.5	1.2	6.0	x	x
256-1	Circulating and cooling SW system	57	45	68	35	205	60	329	3,007	29,348	2	0.5	0.5	0.1	0.1		x
258-1	HP steam drain system	34	24	56	30	144	39	642	6,505	37,493	7	0.9	1.1	0.2	0.4		
261-1	Fuel oil service	30	31	29	29	119	25	672	5,218	101,563	8	1.0	0.9	0.5	0.5		
262-1	Main lube oil piping	38	34	39	21	132	34	559	4,317	70,735	17	0.8	0.7	0.4	1.0	x	x
311-1	SSTGs	6	6	12	8	32	6	1,711	14,281	288,809	51	2.5	2.5	1.5	3.0	x	x
312-1	Emergency generator sets	89	83	85	32	289	93	50	487	9,808	5	0.1	0.1	0.1	0.3	x	
314-1	Power conversion equipment	59	55	48	21	183	53	300	2,316	15,310	17	0.4	0.4	0.2	1.0	x	x
320-1	Power cable	45	48	55	34	182	51	495	2,849	38,695	3	0.7	0.5	0.2	0.2	x	
320-2	Switchgear and panels	49	67	77	30	223	67	400	1,633	17,558	7	0.6	0.3	0.1	0.4		
330-1	Lighting	15	70	43	37	165	47	929	1,406	59,801	0	1.2	0.2	0.3	0.0		
411-1	Tactical data displays	92	97	94	36	319	100	34	47	5,904	1	0.1	0.0	0.0	0.1	x	

(continued)

Table A-1. (continued)

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
412-1	Tactical data processing	92	96	71	25	284	91	34	93	20,776	13	0.1	0.0	0.1	0.8	X	
421-1	Nonelectric/electronic navigation aids	11	15	20	31	77	14	1,322	10,058	159,388	6	2.0	1.7	0.8	0.3		
423-1	Electronic navigation	80	87	61	16	244	76	128	432	31,868	23	0.2	0.1	0.2	1.3	X	
424-1	Depth sounding equipment	79	91	80	32	282	90	130	265	14,788	5	0.2	0.0	0.1	0.3		
426-1	Gyrocompass	51	59	25	22	157	43	384	2,216	126,027	16	0.6	0.4	0.6	0.9	X	X
426-2	Electrical navigation	52	36	15	19	122	26	376	4,154	227,557	19	0.6	0.7	1.2	1.1	X	X
432-1	Telephone systems	41	40	32	37	150	41	543	3,234	93,978	0	0.8	0.6	0.5	0.0		
433-1	Announcing systems	42	56	33	32	163	45	520	2,290	86,654	5	0.8	0.4	0.4	0.3		
434-1	Audio-visual equipment	58	51	59	36	204	59	316	2,581	32,252	1	0.5	0.4	0.2	0.1		
436-1	Alarm, safety, and warning	53	76	67	33	229	68	363	989	29,893	4	0.5	0.2	0.2	0.2		
437-1	Indicating, order, and metering	48	55	47	34	184	54	445	2,316	45,687	3	0.7	0.4	0.2	0.2	X	
440-2	Satellite communications	62	78	18	15	173	49	253	855	182,907	24	0.4	0.1	0.9	1.4	X	
440-3	Quality monitoring and control	82	92	60	31	265	83	105	229	32,044	6	0.2	0.0	0.2	0.3	X	
440-4	Message processing distribution systems (MPDS)	88	90	45	27	250	79	51	367	53,119	11	0.1	0.1	0.3	0.6		
441-1	Communication antenna systems	65	47	62	26	200	58	238	2,859	31,709	12	0.4	0.5	0.2	0.7	X	
441-2	Antennas--multicouplers & tuners	94	99	101	13	307	99	0	0	0	30	0.0	0.0	0.0	1.8		
441-3	Communication transmitters	46	68	9	7	130	33	486	1,581	403,784	53	0.7	0.3	2.1	3.1	X	X
441-4	Communication receivers	27	53	5	17	102	21	687	2,435	766,982	22	1.0	0.4	3.9	1.3	X	X
441-5	Communication transceivers	14	41	4	6	65	12	1,142	3,194	939,376	59	1.7	0.6	4.8	3.4	X	X
441-6	Remote communication devices	54	81	36	14	185	55	354	683	78,404	25	0.5	0.1	0.4	1.5		X

(continued)

Table A-1. (continued)

SWAP	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
442-1	Underwater communication systems	90	86	90	35	301	95	38	450	7,578	2	0.1	0.1	0.0	0.1		
443-1	Visual and audible communication systems	73	82	53	36	244	75	170	497	40,075	1	0.3	0.1	0.2	0.1		
445-1	Teletype and facsimile	24	12	28	28	92	17	722	10,631	101,803	9	1.1	1.8	0.5	0.5	x	x
446-1	Security equipment	57	79	73	27	236	71	329	809	19,600	11	0.5	0.1	0.1	0.6		
450-1	Radar distribution systems	43	25	16	13	97	18	512	6,409	202,589	30	0.8	1.1	1.0	1.7	x	
451-X	Surface search radar	60	74	41	16	191	56	264	1,186	64,070	73	0.4	0.2	0.3	4.3	x	x
452-X	2D air search radar	7	22	2	4	35	8	1,605	6,622	1,920,479	81	2.4	1.1	9.9	4.7	x	x
455-1	IFF	55	61	37	12	165	46	344	1,893	77,437	35	0.5	0.3	0.4	2.0	x	
460-X	Sonar systems	9	10	3	6	28	4	1,591	11,278	1,156,933	59	2.3	1.9	5.9	3.4	x	
465-1	Bathythermograph	88	95	76	34	293	94	51	123	17,637	3	0.1	0.0	0.1	0.2		
471-1	Active ECM	72	80	21	18	191	57	172	749	158,463	20	0.3	0.1	0.8	1.2	x	x
472-1	Passive ECM	37	52	23	10	122	27	571	2,545	154,075	44	0.8	0.4	0.8	2.6	x	x
475-1	Degaussing	36	85	78	32	281	89	66	458	15,858	5	0.1	0.1	0.1	0.3		
480-3	Testing, antisubmarine warfare intra-system	87	89	95	36	307	98	60	380	3,926	1	0.1	0.1	0.0	0.1		
481-X	Gun fire control systems	12	27	8	7	54	10	1,236	5,575	470,448	53	1.8	1.0	2.4	3.1	x	
482-X	Missile fire control systems	2	8	1	2	13	2	2,795	13,717	3,998,949	118	4.1	2.4	20.4	6.9	x	x
483-X	ASW fire control systems	47	73	17	31	168	48	446	1,252	198,207	6	0.7	0.2	1.0	0.3	x	
490-1	Special purpose systems	93	98	100	36	327	102	9	15	20	1	0.0	0.0	0.0	0.1		
491-1	Electronics test, checkout, and monitoring equipment	4	5	13	36	58	11	2,509	17,692	285,755	1	3.7	3.1	1.5	0.1		x
492-1	Flight deck lighting	68	84	58	31	241	74	218	472	35,500	6	0.3	0.1	0.2	0.3		
511-1	Heating systems	20	20	40	20	100	20	798	6,905	69,557	18	1.2	1.2	0.4	1.0		
512-1	Non-machinery ventilation	28	30	50	25	133	36	679	5,272	44,842	13	1.0	0.9	0.2	0.8		x
514-1	Chilled water cooling distribution	13	13	22	20	68	13	1,188	10,367	154,287	18	1.8	1.8	0.8	1.0		x

(continued)

Table A-1. (continued)

SWAB	System Nomenclature	Rank				MHF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
516-1	Ships service refrigeration	44	49	54	35	182	52	504	2,732	39,224	2	0.7	0.5	0.2	0.1		x
520-1/ 521-1	Sea valves/fire and flushing	3	3	10	11	27	3	2,573	20,865	339,551	42	3.8	3.6	1.7	2.4	x	x
528-1	Plumbing drains	67	38	66	35	206	61	219	3,179	29,982	2	0.3	0.6	0.2	0.1		
531-1	Distilling plants	21	28	35	21	105	24	787	5,507	82,900	17	1.2	1.0	0.4	1.0		x
533-1	Potable water service	16	17	26	31	90	16	890	8,075	120,647	6	1.3	1.4	0.6	0.3		x
541-1	Fuel and fuel compensating system	71	64	63	36	234	70	185	1,777	31,440	1	0.3	0.3	0.2	0.1		x
543-1	Aviation and general purpose lube oil system	56	65	69	28	218	63	340	1,760	28,943	9	0.5	0.3	0.1	0.5		
551-1	HP air system	8	16	11	9	44	9	1,598	8,811	324,524	46	2.4	1.5	1.7	2.7		x
551-4	Prairie masker air system	78	72	89	33	272	85	135	1,353	8,484	4	0.2	0.2	0.0	0.2		
555-1	Fog foam and AFFF	39	46	44	32	161	44	548	2,874	53,285	5	0.8	0.5	0.3	0.3		
561-1	Steering system	72	62	87	32	253	80	172	1,863	8,638	5	0.3	0.3	0.0	0.3		
565-1	Stabilizing fins	63	60	75	25	223	66	252	1,966	18,082	13	0.4	0.3	0.1	0.8		
571-1	Replenishment-at-sea winches	74	77	86	29	266	84	163	862	9,729	8	0.2	0.1	0.0	0.5		x
573-1	Cargo handling elevators	40	29	65	20	154	42	546	5,334	30,720	18	0.8	0.9	0.2	1.0		
581-1	Anchor handling and stowage	70	63	83	31	247	78	211	1,805	11,802	6	0.3	0.3	0.1	0.3		x
583-1	Boat handling and stowage	94	99	101	36	330	103	0	0	0	1	0.0	0.0	0.0	0.1		x
583-3	Small boats	35	14	31	24	104	23	617	10,199	99,036	14	0.9	1.8	0.5	0.8		x
593-1	Sanitary waste	94	99	101	29	323	101	0	0	0	8	0.0	0.0	0.0	0.5		
611-1	Hull fittings	32	[illegible]	49	35	123	28	660	14,132	45,225	2	1.0	2.4	0.2	0.1		
613-1	Rigging and canvas	69	54	81	37	241	73	216	2,378	13,172	0	0.3	0.4	0.1	0.0		
622-1	Floor plates and gratings	64	43	79	37	223	65	250	3,070	15,843	0	0.4	0.5	0.1	0.0		
634-1	Deck covering	36	9	51	37	133	35	579	11,337	41,241	0	0.9	2.0	0.2	0.0		x
635-1	Hull insulation	50	32	88	37	207	62	387	4,919	8,570	0	0.6	0.8	0.0	0.0		
651-1	Commissary spaces	17	39	40	37	133	37	849	3,339	62,947	0	1.3	0.6	0.3	0.0		

(continued)

Table A-1. (continued)

SWAP	System Nomenclature	Rank				MRF	MRF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREFs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREFs	JCNs	Man-Hours	Parts Costs	CASREFs		
654-1	Utility spaces	29	21	64	33	147	40	674	6,814	30,729	4	1.0	1.3	0.7	0.2		
660-1	Working spaces	33	33	27	37	130	32	655	4,648	113,857	0	1.0	0.8	0.6	0.0		
665-1	HM&E workshops	18	44	30	37	129	31	805	3,023	99,946	0	1.2	0.5	0.5	0.0		X
670-1	Non-cargo stowage spaces	19	11	38	35	103	22	799	10,909	72,788	2	1.2	1.9	0.4	0.1		
711-1	Guns and mounts	25	26	24	12	87	15	710	6,027	146,560	35	1.0	1.0	0.7	2.0	X	X
721-1	Missile launching systems	5	18	7	5	35	7	1,720	7,418	512,250	63	2.5	1.3	2.6	3.7	X	X
722-2	Missile handling and stowage	22	37	19	20	98	19	768	3,764	162,223	18	1.1	0.6	0.8	1.0		
772-1	Ammunition cargo handling and stowage	90	94	57	36	277	87	38	150	37,163	1	0.1	0.0	0.2	0.1		
830-1	Design services	76	66	99	37	277	86	150	1,659	2,017	0	0.2	0.3	0.0	0.0		X
843-1	Tests	58	58	84	37	237	72	316	2,241	11,491	0	0.5	0.4	0.1	0.0		
993-3	Care and preservation	23	2	72	37	134	38	750	24,514	19,717	0	1.1	4.2	0.1	0.0		

Table A-2. FF-1040 CLASS MAINTENANCE-CRITICAL SYSTEMS

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
110-1	Underwater body hull	77	78	92	43	290	87	264	1,827	10,794	3	0.2	0.2	0.1	0.1	x	
120-1	Hull structural bulkheads	90	59	103	39	291	88	117	3,664	1,741	7	0.1	0.4	0.0	0.3		
123-1	Tanks	65	51	102	40	258	79	402	4,251	4,005	6	0.3	0.4	0.0	0.3		x
150-1	Deck house structure	83	69	98	45	295	90	188	2,724	6,702	1	0.2	0.3	0.0	0.0		
165-1	Sonar domes	86	74	83	40	283	34	168	2,475	24,235	6	0.2	0.3	0.1	0.3		
167-1	Structural closures	26	12	40	41	119	24	1,186	19,618	126,364	5	1.0	2.0	0.6	0.2		x
221-1	Propulsion boilers	1	1	4	1	7	1	5,635	62,983	724,194	191	5.0	6.5	3.7	8.1	x	x
231-1	Propulsion steam turbines	57	39	48	34	178	50	564	5,734	89,975	13	1.0	0.6	0.5	0.6	x	x
241-1	Propulsion reduction gears	81	85	39	43	248	75	205	1,183	129,151	3	0.2	0.1	0.7	0.1	x	
243-1	Propulsion shafting	75	63	90	35	263	80	285	3,140	12,546	11	0.3	0.3	0.1	0.5	x	x
251-1	Combustion air system	89	89	85	45	308	97	120	1,075	20,865	1	0.1	0.1	0.1	0.0		x
252-1	Automatic propulsion controls	84	80	86	44	294	89	186	1,402	20,432	2	0.2	0.1	0.1	0.1	x	
253-1	Main steam piping	15	7	19	33	74	12	1,615	28,088	240,535	14	2.0	2.9	1.2	0.6	x	x
254-1	Main condensers and air ejectors	80	77	97	44	298	91	245	1,970	6,894	2	0.2	0.2	0.0	0.1	x	
255-1	Feed and condensate	5	2	11	2	20	3	2,809	39,305	435,730	137	3.0	4.1	2.2	5.8	x	x
256-1	Circulating and cooling SW system	53	37	60	37	187	51	593	6,012	64,021	9	1.0	0.6	0.3	0.4		x
258-1	HP steam drain system	21	18	54	31	124	27	1,281	14,576	73,486	17	1.0	1.5	0.4	0.7		
261-1	Fuel oil service	24	23	20	18	85	16	1,228	12,108	232,515	39	1.0	1.3	1.2	1.7		
262-1	Main lube oil piping	35	34	44	26	139	33	993	6,745	110,449	23	1.0	0.7	0.6	1.0	x	x
311-1	SSTGs	6	8	21	8	43	5	2,664	25,207	227,797	69	3.0	2.6	1.2	3.0	x	x
311-4	Ship service power generation	101	104	104	45	354	105	6	30	3	1	0.0	0.0	0.0	0.0		
312-1	Emergency generator sets	63	71	47	29	210	59	430	2,603	91,500	19	0.4	0.3	0.5	0.8	x	
314-1	Power conversion equipment	72	52	75	31	230	68	359	4,195	36,272	17	0.3	0.4	0.2	0.7	x	x
320-1	Power cable	37	58	63	40	198	54	925	3,702	51,316	6	0.9	0.4	0.3	0.3	x	
320-2	Switchgear and panels	49	70	71	35	225	66	654	2,655	38,603	11	0.6	0.3	0.2	0.5		

(continued)

Table A-2. (continued)

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
330-1	Lighting	11	72	42	45	170	47	1,975	2,595	115,300	1	1.9	0.3	0.6	0.0		
411-1	Tactical data displays	61	94	24	39	218	62	444	456	187,804	7	0.4	0.0	1.0	0.3	X	
412-1	Tactical data processing	82	95	52	38	267	81	197	405	76,488	8	0.2	0.0	0.4	0.3		
421-1	Nonelectric/electronic navigation aids	13	15	23	33	84	15	1,932	15,331	193,234	14	1.8	1.6	1.0	0.6		X
424-1	Electronic navigation	60	79	18	12	169	46	451	1,779	240,728	51	0.4	0.2	1.2	2.2	X	
424-1	Depth sounding equipment	78	86	87	34	285	86	248	1,162	20,343	14	0.2	0.1	0.1	0.6		
426-1	Gyrocompass	52	42	34	22	150	37	610	5,436	150,844	29	0.6	0.6	0.8	1.2	X	X
426-2	Electrical navigation	54	33	13	9	109	21	585	7,086	371,919	62	0.6	0.7	1.9	2.6	X	X
432-1	Telephone systems	36	38	27	45	146	36	956	6,006	172,828	1	0.9	0.6	0.9	0.0		
433-1	Announcing systems	43	48	35	45	171	48	776	4,536	145,382	1	0.7	0.5	0.7	0.0		
434-1	Audio-visual equipment	50	47	59	44	200	56	642	4,599	64,201	2	0.6	0.5	0.3	0.1		
436-1	Alarm, safety, and warning	51	75	64	40	230	70	619	2,145	50,878	6	0.6	0.2	0.3	0.3		
437-1	Indicating, order, and metering	45	62	33	27	167	44	719	3,574	151,182	21	0.7	0.4	0.8	0.9	X	
440-2	Satellite communications	59	84	14	11	168	45	446	1,315	325,026	52	0.4	0.1	1.7	2.2	X	
440-3	Quality monitoring and control	89	98	80	39	306	96	120	223	27,871	7	0.1	0.0	0.1	0.3	X	
440-4	Message processing distribution systems (MPDS)	87	100	32	34	253	78	140	108	162,497	13	0.1	0.0	0.8	0.6		
441-1	Communication antenna systems	69	43	84	26	222	63	379	4,958	23,611	22	0.4	0.5	0.1	0.9	X	
441-2	Antennas--multicouplers & tuners	102	105	105	14	326	100	0	0	0	45	0.0	0.0	0.0	2.0		
441-3	Communication transmitters	34	66	5	6	111	22	999	2,984	655,241	85	0.9	0.3	3.4	3.6	X	X
441-4	Communication receivers	19	40	3	20	82	14	1,380	5,511	970,414	32	1.3	0.6	5.0	1.3	X	X
441-5	Communication transceivers	12	36	1	4	53	9	1,946	6,449	1,406,307	102	1.8	0.7	7.2	4.3	X	X
441-6	Remote communication devices	66	88	41	30	225	67	401	1,121	116,909	18	0.4	0.1	0.6	0.8		X

(continued)

Table A-2. (continued)

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
442-1	Underwater communication systems	99	102	95	43	339	102	53	92	8,413	3	0.0	0.0	0.0	0.1		
443-1	Visual and audible communication systems	79	92	67	45	283	85	247	533	45,462	1	0.2	0.1	0.2	0.0		
445-1	Teletype and facsimile	17	27	28	36	108	19	1,473	9,826	170,137	10	1.4	1.0	0.9	0.4	X	X
446-1	Security equipment	46	57	55	16	174	49	674	3,709	73,301	42	0.6	0.4	0.4	1.8		
450-1	Radar distribution systems	40	54	15	26	135	32	855	4,101	321,114	22	0.8	0.4	1.6	0.9	X	
451-X	Surface search radar	55	81	36	21	193	53	584	1,373	138,713	31	0.6	0.1	0.7	1.3	X	X
452-X	2D air search radar	48	45	7	17	117	23	665	4,670	541,803	41	0.6	0.5	2.8	1.7	X	X
455-1	IFF	71	82	38	19	210	60	364	1,372	131,399	33	0.3	0.1	0.7	1.4	X	
460-X	Sonar systems	3	6	2	3	14	2	3,368	28,218	1,104,023	116	3.2	2.9	5.6	5.0	X	
462-1	Passive sonar	100	103	99	45	347	104	26	52	6,111	1	0.0	0.0	0.0	0.0		
465-1	Bathythermograph	91	99	69	39	298	94	108	215	42,191	7	0.1	0.0	0.2	0.3		
471-1	Active ECM	74	87	30	24	215	61	312	1,144	168,711	25	0.3	0.1	0.9	1.1	X	X
472-1	Passive ECM	33	55	29	10	127	28	1,053	4,098	169,879	56	1.0	0.4	0.9	2.4	X	X
473-1	Torpedo decoys	92	90	74	42	298	93	103	866	36,821	4	0.1	0.1	0.2	0.2		
475-1	Degaussing	85	83	96	34	298	92	184	1,345	8,253	14	0.2	0.1	0.0	0.6		
480-3	Testing, antisubmarine warfare intra-system	96	97	82	45	320	99	78	243	25,570	1	0.1	0.0	0.1	0.0		
481-X	Gun fire control systems	9	21	8	5	43	7	2,170	12,350	536,671	86	2.1	1.3	2.7	3.6	X	
482-X	Missile fire control systems	97	101	77	44	319	98	67	98	33,292	2	0.1	0.0	0.2	0.1	X	
483-X	ASW fire control systems	41	73	17	30	161	42	843	2,516	263,782	18	0.8	0.3	1.3	0.8	X	
491-1	Electronics test, checkout, and monitoring equipment	4	5	10	40	59	10	3,144	28,245	442,753	6	3.0	2.9	2.3	0.3		X
492-1	Flight deck lighting	76	91	72	36	275	83	272	719	38,274	10	0.3	0.1	0.2	0.4		
511-1	Heating systems	27	24	45	24	120	25	1,183	11,532	107,766	25	1.1	1.2	0.6	1.1		
512-1	Non-machinery ventilation	23	26	51	32	132	31	1,239	10,973	84,202	15	1.2	1.1	0.4	0.6		X

(continued)

Table A-2. (continued)

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
514-1	Chilled water cooling distribution	10	11	16	26	63	11	2,117	19,659	274,817	22	2.0	2.0	1.4	0.9		x
516-1	Ships service refrigeration	44	35	37	35	151	38	756	6,662	138,530	11	0.7	0.7	0.7	0.5		x
520-1/ 521-1	Sea valves/fire and flushing	2	4	6	15	27	4	3,388	30,831	592,627	44	3.2	3.2	3.0	1.9	x	x
528-1	Plumbing drains	64	49	70	41	224	64	409	4,426	41,929	5	0.4	0.5	0.2	0.2		
531-1	Distilling plants	14	16	43	13	86	17	1,669	15,276	114,598	50	1.6	1.6	0.6	2.1		x
533-1	Potable water service	22	20	26	32	100	18	1,251	12,416	177,959	15	1.2	1.3	0.1	0.6		x
541-1	Fuel and fuel compensating system	6.	67	61	40	230	69	440	2,873	61,808	6	0.4	0.3	0.3	0.3		x
542-3	MOGAS handling and piping	98	96	101	45	340	103	54	322	4,984	1	0.0	0.0	0.0	0.0		
543-1	Aviation and general purpose lube oil system	56	53	58	36	203	57	580	4,116	71,124	10	0.6	0.4	0.4	0.4		
545-1	Tank heating	95	93	100	45	333	101	88	511	5,084	1	0.1	0.1	0.0	0.0		
551-1	HP air system	7	14	12	10	43	6	2,225	16,536	376,138	56	2.1	1.7	1.9	2.4		x
551-4	Prairie masker air system	67	50	65	23	205	58	381	4,380	40,189	27	0.4	0.5	0.3	1.1		
555-1	Fog foam and AFFF	42	64	53	40	199	55	784	3,095	75,073	6	0.7	0.3	0.4	0.3		
561-1	Steering system	64	68	91	28	251	76	409	2,738	12,407	20	0.4	0.3	0.1	0.8		
565-1	Stabilizing fins	70	65	78	22	235	71	373	3,012	31,654	29	0.4	0.3	0.2	1.2		
571-1	Replenishment-at-sea winches	70	60	76	37	243	73	373	3,622	33,581	9	0.4	0.4	0.2	0.4		x
573-1	Cargo handling elevators	32	25	62	25	144	34	1,073	11,263	61,205	24	1.0	1.2	0.3	1.0		
581-1	Anchor handling and stowage	58	56	93	37	244	74	464	3,995	10,752	9	0.4	0.4	0.1	0.4		x
583-2	Life-saving equipment	94	76	88	44	302	95	92	2,069	18,780	2	0.1	0.2	0.1	0.1		x
583-3	Small boats	16	10	31	19	76	13	1,518	21,031	168,166	33	1.4	2.2	0.9	1.4		x
593-1	Sanitary waste	102	105	105	44	356	106	0	0	0	2	0.0	0.0	0.0	0.1		
611-1	Hull fittings	29	9	50	41	129	29	1,130	22,720	85,788	5	1.0	2.4	0.4	0.2		
613-1	Rigging and canvas	73	44	89	46	252	77	320	4,948	12,877	0	0.3	0.5	0.1	0.0		

(continued)

Table A-2. (continued)

SWAB	System Nomenclature	Rank				MBF	MBF Rank	Class Burden				Percentage of Class Burden				Critical To Primary Mission	Repairs Included In Repair Profile
		JCNs	Man-Hours	Parts Costs	CASREPs			JCNs	Man-Hours	Parts Costs (Dollars)	CASREPs	JCNs	Man-Hours	Parts Costs	CASREPs		
622-1	Floor plates and gratings	68	32	79	46	225	65	380	7,674	28,538	0	0.4	0.8	0.1	0.0		
634-1	Deck covering	47	17	81	46	191	52	666	15,197	26,182	0	0.6	1.6	0.1	0.0		x
651-1	Commissary spaces	8	28	46	40	122	26	2,176	9,207	105,995	6	2.1	1.0	0.5	0.3		
654-1	Utility spaces	30	19	68	41	158	40	1,122	14,214	46,467	5	1.1	1.5	0.2	0.2		
660-1	Working spaces	31	30	56	46	163	43	1,104	8,247	73,243	0	1.0	0.9	0.4	0.0		
665-1	HM&E workshops	25	29	49	43	146	35	1,220	8,911	86,037	3	1.2	0.9	0.4	0.1		x
670-1	Non-cargo stowage spaces	20	22	22	45	109	20	1,363	12,257	214,686	1	1.3	1.3	1.1	0.0		
711-1	Guns and mounts	18	13	9	7	47	8	1,417	18,288	514,106	70	1.3	1.9	2.6	3.0	x	x
721-1	Missile launching systems	39	46	25	20	130	30	902	4,645	178,885	32	0.9	0.5	0.9	1.4	x	x
722-2	Missile handling and stowage	28	41	57	27	153	39	1,148	5,451	72,932	21	1.1	0.6	0.4	0.9		
772-1	Ammunition cargo handling and stowage	88	61	94	29	272	82	133	3,587	8,754	19	0.1	0.4	0.0	0.8		
991-1	Care and preservation	38	3	73	46	160	41	921	33,757	37,743	0	0.9	3.5	0.2	0.0		
ORD-1	Expendable ordnance (missiles, mines, torpedoes)	93	31	66	46	236	72	96	8,146	48,682	0	0.1	0.8	0.2	0.0		

Table A-3. FFG-1 CLASS MAINTENANCE-CRITICAL EQUIPMENTS

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
82	110-1	Underwater body hull	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		Valve plt, .50IPS, 20PSI	882220294
		Valve plt, .25IPS, 13T, 20PSI	882220363
		Valve plt, .50IPS, 5T, 80PSI	882220313
88	120-1	Hull structural bulkheads	
		Burden reported at system level.	None
81	123-1	Tanks	
		Burden reported at system level.	None
92	130-1	Flight and helicopter decks	
		Burden reported at system level.	None
77	165-1	Sonar domes	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
29	167-1	Structural closures	
		Burden reported at system level.	None
1	221-1	Propulsion boilers	
		Mn stm boiler, 1300PSI	021550081
		Mn stm boiler, 1300PSI	021550090
		Mn stm boiler, 1300PSI	021550083*
		Gate valve, 2.5IPS, 1500 PSI	882044936*
		GLB valve, .50IPS, 1500PSI	882055178
			882001343
		CTFGL supercharger	053010003
		CTFGL supercharger	053010004
		(continued)	

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	221-1 (cont)	Burner oil press atmg, 4000lbs, 14.437in BBL	300080100
		Burner oil press atmg, 4000lbs, 14.437in BBL	300080101
50	231-1	Propulsion steam turbines	
		Turbine stm mn LP	051800346
		Turbine stm mn HIP, 7889rpm, 17100shp	051800344
		Thermometer SLFINDG, 90 deg	1-870001272
		Starter motor, SZ1, 440/220/110V	151207647
		Condenser stm aux	040010019
		Turbine stm mn LP, 35000shp	051260782
96	233-1	Main propulsion diesel engines	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
97	241-1	Propulsion reduction gears	
		Gear assy, SPD decr	691980149
		Gear assy, SPD decr mn	691300125
64	243-1	Propulsion shafting	
		Bearing assy ln shft, INBD	371010171
		Stuffing box	831000122
30	253-1	Main steam piping	
		Burden reported at system level.	None
69	254-1	Main condensers and air ejectors	
		Ejector assembly, 120PSI, 2NZL, 2stg	730750066
		Condenser stm mn, 600sqft, 3892TB	040090098
		Condenser stm aux, 54.8sqft, 100TB	040010019
5	255-1	Feed and condensate	
		CTFGL pump, 590gpm, 1380PSI, 6650rpm, TD	016031402
		CTFGL pump, 630gpm, 65PSI, 1745rpm, MD	016210189
		CTFGL pump, 320gpm, 60PSI, 1160rpm, MD	016210191
		CTFGL pump, 630gpm, 65PSI, 1170rpm, MD	016000417
		(continued)	

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	255-1 (cont)	CTFGL pump, 590gpm, 1450PSI, 7500rpm, TD	017020027
		Turbine stm mn, FD pump	057300045
		Turbine stm mn, FD pump	057260193
		Valve gate, 5.00IPS, 900PSI	882043874
		CTFGL pump, 320gpm, 60PSI, 1150rpm, MD	016031405
		Valve ANL, .50IPS, 1500PSI	882002159
		Heater deaerating, 254730lbs/hr cap	074240031
		Valve CHK, STP GLB, 4.00IPS, 900PSI	882033066
		CTFGL pump, 15gpm, 70PSI, 3500rpm	016110267
		Motor ac, 440V, 40hp, 1175rpm	174802450
		Valve DPHRM, CONT plt oper, 4.00IPS, 1500PSI	882190901
		Valve RLF, 1.00IPS	883113127
60	256-1	Circulating and cooling SW system	
		Motor ac, 440V, 7.5hp, 3515rpm	174751418
		CTFGL pump, 13500gpm, 14PSI, 1100rpm	016031399
		Turbine stm mn, FD pump	057950087
		Valve CHK, STP ANL, 13.00IPS, 100PSI	882032794
		Valve gate, 24.00IPS, 30PSI	882043629
39	258-1	HP steam drain system	
		CTFGL pump, 30gpm, 58PSI, 1715rpm, MD	016210192
		Motor ac, 440V, 100hp, 1775rpm	174802651
		CTFGL pump, 15gpm, 70PSI, 3500rpm	016110267
		Valve red, 1.00IPS, 1500PSI, 100T	882094637
		Valve GLB, .50IPS, 1500PSI	882054046
			883113456
		Valve gate, 1.00IPS, 1500PSI	882044235
		Valve GLB, .75IPS, 1500PSI	882051967
		Motor ac, 440V, 5hp, 3450rpm	174720469
		Valve GLB, .50IPS, 1500PSI	882051966
		Valve plt, .25IPS, 20PSI	882220363
		Controller ac, mag LVP, SZ2, 440V, 2SPD	151205472
		Valve RLF, 1.50IPS, 575T, 719PSI	883112640
		Valve gate, .50IPS, 600PSI	882044064
		Valve GLB, 1.5IPS, 1500PSI	882053287
		Valve red spcl, .25IPS, 200PSI, 5T	882240565
		Valve gate, 1.00IPS, 1500PSI	882044549
		Valve GLB, .50IPS, 1500PSI	882055285

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
25	261-1	Fuel oil service	
		Rty pwr pump, 25gpm, 590PSI, 1750rpm	016160460
		Burner oil, press atmg, 40001bs, 14.437in BBL	300080100
		Motor ac, 440V, 20hp, 1800rpm	174342032
		Valve gate, 6.00IPS, 150PSI	882045362
		Valve RLF, .50IPS, 558T, 677PSI	883113283
		Valve B GLB, 1.5IPS, 300PSI	882302242
		Rty pwr pump, 2.86gpm, 1800rpm, MD	017210055
		Valve RLF, .50IPS, 581T, 702PSI	883113196
34	262-1	Main lube oil piping	
		Valve, pmp gov, 1.0IPS, 600PSI, 15T, 50PSI	882260313
		CTFGL purifier, FO × LO, 225gph	760010081
		CTFGL purifier, FO × LO, 225gph	760200196
		Rty pwr pump, 500gpm, 55PSI, 1750RPM, TD	016160463
		Turbine stm, LO ser pump	057150188
		Motor ac, 440V, 40hp, 1800rpm	174342031
		Strainer dplx, 5.00in	750440017
6	311-1	SSTGs	
		Dsl engine 10, 38F5, 716hp, 1200rpm	665360215
		Dsl engine 10, 38F5, 716hp, 1200rpm	665360216
		Turbine gen stm, 500kW	057800169*
		Turbine gen stm, 500kW	057260191
		CTFGL pump	016110271
		Strainer dplx, 2.0in	750430213
93	312-1	Emergency generator sets	
		Generator ac, 450V, 500kW, 1200rpm	162300011
		Generator ac, 450V, 500kW, 1200rpm	162900152
53	314-1	Power conversion equipment	
		Motor generator, 440Vac, 450Vac, 30kW	181240036
		Regulator V, spr400, lvr44-40	420570001
		Regulator V, 10300-100	420320005
		Power supply, 440Vac, 50Vdc, 3.0kW	111700010

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
51	320-1	Power cable	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		Cable, type THOF-400	2-620014070
		Motor ac, 440V, 5hp, 3450rpm	174802373
		Transformer pwr, stpd, 1500VA, 450/120V	131400124
		Cable × accy, casualty pwr supply ac	2-620014055
67	320-2	Switchgear and panels	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
47	330-1	Lighting	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		Lantern elec, sym105	249990380
		Relay ac, 110V, 2pole, 10.0amp control	198301023
100	411-1	Tactical data displays	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
91	412-1	Tactical data processing	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
14	421-1	Nonelectric/electronic navigation aids	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
76	423-1	Electronic navigation	
		AN/SRN-15, beacon-transponder set	57130213
90	424-1	Depth sounding equipment	
		AN/UQN-1H, sounding set	58413640
43	426-1	Gyrocompass	
		Compass gyro, Mk19, Mod3B	252360028
		Amplifier synch SNL, Mk31, Mod8A	253830008
		Power supply stnby	259390001
		Indicator scou, Mk2, Mod2	253050016
26	426-2	Electrical navigation	
		Plotting table, MkNC2, Mod1	287810001
		Plotting table, MkNC2, Mod2	282130001
		Indicator transmitter, UWTR log	870420003
		Indicator DRA	282130003
		Hoist rodmeter, hnd oper	581030003
		Indicator DRA, Mk2, Mod1	287810002
41	432-1	Telephone systems	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		H-200/U, headset	67190000
		Jackbox type G-15C	70038202*
		C-7594 A/U, control, remote switching	61399919
		Relay ac × dc, 2pole, 2.0amp timing	199020004
		LS-458/SIC, intercommunication station	72754458
45	433-1	Announcing systems	
		AN/SIA-114A, amplifier-oscillator group	56904905
		AM-4453/U, amplifier speaker	52502400
		Switch tgl, sym 780.5	219990749
		LS-386A/SIC, intercomm station	72748605
		Amplifier AF, ty AM 2416/SIA	261050014
		AN/SIA-114B, amplifier-oscillator group	56904910

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

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Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
59	434-1	Audio-visual equipment	
		Projector SMP, 16mm	26150012
		Projector SMP, 16mm	261750006
		C-3766 A/WIH, control, recorder-reproducer	61376605
		Projector SMP, 16mm	261850011
68	436-1	Alarm, safety, and warning	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
54	437-1	Indicating, order, and metering	
		Indicator transmitter	271080197
		Panel ind sal, ty IC/D6RM	381050011
		Panel ind sal	381040042
		Indicator transmitter EOR	271140017
		Temperature measuring kit	2-870004111
		Indicator rec, tank lvl	384890324
		Panel ind sal, IC/D2RMSA2M	381050254
49	440-2	Satellite communications	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
83	440-3	Quality monitoring and control	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
79	440-4	Message processing distribution systems	
		AN/SKR-4, receiver, telemetric data	56871110
		AN/USM-281, oscilloscope test	58627081
58	441-1	Communication antenna systems	
		AS-2537/SR	59309931
		66047, Fc1, whip antenna	06604700
		AS-2537A/SR, antenna	59129531
		(continued)	

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Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	441-1 (cont)	66046, antenna mast section	0660460*
99	441-2	Antennas -- multicouplers & tuners Burden reported at system level.	None
33	441-3	Communication transmitters AN/URT-23A(V), transmitting set, radio AN/WRC-1, radio set AN/URT-24A, transmitting set, radio AM-3924A(P)/URT, amplifier, radio freq AN/URT-24, transmitting set, radio AN/URT-23(V), transmitting set, radio	 58557800CL 59001100CL 58557835CL 52389000 58557824CL* 58557823CL
21	441-4	Communication receivers R-1051/URR, receiver AN/SRR-19A, receiving set, radio AN/WRR-3A, receiving set, radio AN/URA-38A, antenna coupler, radio AN/SRR-19, receiving set, radio R-390A/URR, receiver, RA radio AN/WRR-3B, receiving set, radio R-1051E/URR, receiver, RA radio	 81095100 57141318 59005301* 58433801 57141319 81039001 59005302 81099010
12	441-5	Communication transceivers AN/URC-9, radio set AN/SRC-20, radio set AN/SRC-2 radio set AN/URC-9, Fc-1	 58439716 57112000 57112100 10017419NA
55	441-6	Remote communication devices Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
95	442-1	Underwater communication systems AN/WQC-2A, communication set, sonar	 58992423

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
75	443-1	Visual and audible communication systems	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
17	445-1	Teletype and facsimile	
		AN/UGC-6K, printer, TTY page	58138242
		AN/UGC-25A, teletypewriter set	58139025
		AN/UGC-16, teletypewriter set	58139050
71	446-1	Security equipment	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
18	450-1	Radar distribution systems	
		AN/SPA-25A, indicator group	56982411
		AN/SPA-25C, indicator group	56982420
		AN/SPA-66B, radar indicator	56986610
		AN/SPA-25B, indicator group	56982418
		AN/SPA-66, indicator group	56986600
56	451-X	Surface search radar	
		AN/SPS-10F, radar set	57036630
		90073-LM-66, 36mi range radar	37391404
8	452-X	2D air search radar	
		CP-784/U	62406440*
		IP-801/SPS-52, indicator digital display	95445500
		T-1221/SPS-52A, transmitter, radar	88486011
		OA-6566/SPS-52, computer, radar group	62405340
		PU-455/U, motor generator, radar	57040801
46	455-1	IFF	
		AN/UPM-137A, radar	58286940
		AN/UPX-23, interrogator set	58393723
		(continued)	

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	455-1 (cont)	AN/UPX-11, interrogator set	58393100
		AN/UPX-17, transponder set	58393700
		MX-8758/UPX, blanker interference	57194369
		AN/UPM-98, test set radar	58289800
4	460-X	Sonar systems	
		AN/SQS-26 BX, detecting-ranging set, sonar	57091610
		AN/SQS-26 AXR, detecting-ranging set, sonar	57091608
		Cooler FD, 6.18sqft, 57TB, ty A	030010110
94	465-1	Bathythermograph	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
57	471-1	Active ECM	
		AN/ULQ-6B, countermeasures set	58158610
		AN/SLQ-25, torpedo countermeasures set	57011410
		AN/SLQ-24A(V)1, countermeasures set	56940342CL
27	472-1	Passive ECM	
		AN/WLR-1C with transistorized radio	58981717*
		AN/WLR-1G, receiving set, ECM	58981705
		AN/WLR-1A w/o tuner, receiving set	58981706*
		AN/SLA-12A	56935918
		AN/SLQ-32(V)2, CRPS	56940357
		AS-571A/SLR, antenna array	59157100
		AN/SLA-10A, blanker-video mixer group	56935901*
89	475-1	Degaussing	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
98	480-3	Testing, antisubmarine warfare intra-system	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
10	481-X	Gun fire control systems	
		Director, gun, Mk56, M7&8	49402624
		Element, stable, Mk6	49400240*
		Elev-train amp mot-gen, for dir, gun, Mk56, M3,6,7&8	49402678
		Mk35, Mod2, radar equipment	49402600
		Console, Mk4, M9&17	49402657*
2	482-X	Missile fire control systems	
		AN/SPG-51C, digital update	49402955
		Mk24, Mod0, transmitter, target designation	49400960
		Mk72, Mod13, converter, signal data	49401919
		Mk73, Mod1, director, gun & guided missile, ser 52-87	49402832
		Mk73, Mod1, director, gun & guided missile, ser 18-51	49402831
		Mk152, Mod1, digital computer	49402772
		Mk1, Mod2, weapons direction equip	49401754
48	483-X	ASW fire control systems	
		Mk53, Mod0, console, attack	005000002
		Switchboard Fc, Mk33, Mod15	220510093*
102	490-1	Special purpose systems	
		Burden reported at system level.	None
11	491-1	Electronics test, checkout, and monitoring equipment	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		AN/USM-281, oscilloscope	58627081
		89536-893A, Voltmeter, electronic	61954492
		AN/USM-115, calibrator set, range	58614100
		AN/USM-117C, oscilloscope	58614308

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
74	492-1	Flight deck lighting	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
20	511-1	Heating systems	
		Boiler stm aux, 155PSI, 40001bs/hr cap	022050020
		Boiler stm aux, 155PSI, 40001bs/hr cap	022050019
		Heater vent, DCTP, SZ S23L	070990032
		Heater vent, DCTP, SZ S21L	070990021
		Heater vent, DCTP, SZ S21M	070990022
		Valve GLB, .50IPS, 1500PSI	882051966
		CTFGL pump, 8gpm, 22PSI, 3500rpm	017030046
		Heater vent, DCTP, SZ S24L	070990036
		Heater vent, DCTP, SZ S25L	070990041
		Rty pwr pump, 330gpm, 100PSI, 1725rpm	017210135
		Boiler stm mn, 635PSI, 1837TB	021550019*
		Heater wtr insts, 40.0gpm max	074100017
36	512-1	Non-machinery ventilation	
		Motor ac, 2spd, 440V, 15/6.7hp	174720549
		Fan vanaxial, portable	2-380044060
		Fan vanaxial, prtl, SZ 01-2A1X5, 500cfm	400090105
		Motor ac, 2spd, 440V, 15/6.7hp	174720471
		Motor ac, 440V, 1.5hp, 3450rpm	174720467
		Motor ac, 440V, 1.25hp, 3450rpm	174720470
		Ice-making machine, flake	326120042
		Motor ac, 2spd, 440V, 4/1.8hp	174720519
13	514-1	Chilled water cooling distribution	
		CTFGL pump, 75gpm, 60PSI, 3500rpm	016110270
		CTFGL pump, 75gpm, 60PSI, 3480rpm	0162101083
		Compressor RFG, vert	060950146
		Motor ac, 440V, 30hp, 1760rpm	174801836
		Compressor RFG, ty V	060150113
		Refrigeration plant, air cond, 24ton cap	325010279*
		Motor ac, 440V, 10hp, 1800rpm	174342044
		Refrigeration plant, air cond, 24ton cap	325000227
		Motor ac, 440V, 7.5hp, 3480rpm	174[illegible]2396
		Compressor RFG, ty W	060950152

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
52	516-1	Ships service refrigeration	
		Refrigeration system, food sto, 4ton cap	325000226
		Refrigeration system, food sto, 1.8ton cap	325010278
3	520-1/ 521-1	Sea valves/fire and flushing	
		Gate valve, 5.0IPS, 250PSI	882044023
		CTFGL pump, 900gpm, 125PSI, 1775rpm, MD	016210195
		CTFGL pump, 900gpm, 125PSI, 3550rpm	016020765*
		CTFGL pump, 150gpm, 30PSI, 1750rpm, mcc	017000027
		CTFGL pump, 900gpm, 125PSI, 1800rpm, MD	016150938
		Valve GLB, B, 3.00IPS, 150PSI	882303684
		Engine dsl, 25.0hp, 2400rpm	667770002
		Valve red, 4.0IPS, 150PSI, 30T, 60PSI	882091115
		Motor ac, 440V, 100hp, 1775rpm	174802651
		Motor ac, 440V, 100hp, 3510rpm	174030910*
		Valve gate, 3.0IPS, 250PSI	882042017
61	528-1	Plumbing drains	
		Valve press reg, 1.00IPS, 50PSI	882094394
		Ejector, 4.00in conn, 100PSI, 10ft suct, 27ft hd	740000207
		CTFGL pump, 30gpm, 58PSI, 3500rpm, mcc	016031398
24	531-1	Distilling plants	
		CTFGL pump, 120GPM, 30PSI, 3500rpm	016110276
		Distillation unit, 12000gpd, 501TB	080030019
		Distillation unit, 8000gpd, 398TB	080100020
		CTFGL pump, 4gpm, 50PSI, 3550rpm, mcc	016020791
		Valve, SOL, 115Vac, .75IPS	882180795
		CTFGL pump, 7gpm, 35PSI, 3550rpm, mcc	016020792
		Motor ac, 440V, 1.5hp, 3520rpm	174751264
16	533-1	Potable water service	
		CTFGL pump, 40gpm, 50PSI, 3515rpm	016210196
		CTFGL pump, 40gpm, 50PSI, 3500rpm	016110273
		CTFGL pump, 15gpm, 25PSI, 3555rpm	016110321
		Demineralizer, pure water system	080150006
		(continued)	

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	533-1 (cont)	Heater wtr insts, 20gpm max	074100015
		CTFGL pump, 125gpm, 80PSI, 3500rpm	016110356
		Strainer sgl, 8.0in	750430212
		Valve RLF, 1.5IPS, 49T, 68PSI	883113209
		CTFGL pump, 30gpm, 58PSI, 3500rpm	016031398
		CTFGL pump, 155gpm, 100PSI, 3530rpm	016110325
		Motor ac, 2spd, 440V, 15/6.7hp	174720471
		Valve temp regg, 1.25IPS, 140T, 180°F	882142134
70	541-1	Fuel and fuel compensating system	
		Burden reported at system level.	None
63	543-1	Aviation and general purpose lube oil system	
		Valve RLF, 1.25IPS, 43T, 69PSI	883113197
		Motor ac, 440V, 3hp, 1730rpm	174751113
		Rty pwr pump, 50.0gpm, 75PSI, 520rpm, MD	016200106
		Valve ANL, 2.50IPS, 100PSI	882000473
9	551-1	HP air system	
		Compressor HIP air, 7.5cfh, 3000PSI	061900210
		Compressor LP air, 100cfm, 125PSI	061900359
		Dehydrator fltr dscc, 15scfm, 80PSIG	440210029
		Valve RLF ANL, .50IPS, 18T, 32PSI	883113348
		Compressor LP air, 100cfm, 150PSI	061900294*
		Compressor HIP air, 20cfh, 3000PSI	061430260
		Valve RLF, .50X, .75IPS, 116T, 150PSI	883112214
		Valve GLB, .37IPS, 6000PSI	882054058
		Dehydrator fltr RT-GT, 30scfm, 120PSIG	440300014
		Motor ac, 440V, 30hp, 1760rpm	174750904
		Valve RLF, .75IPS, 35T, 44PSI	883114901
		Dehydrator fltr RFGT, 100scfm	440300032
		Valve GLB, .25IPS, 600PSI	882053987
85	551-4	Prairie masker air system	
		Turbine stm, aux gen	057260189*
		Compressor CTFGL, 1400cfm, 25PSI	061900282
		CTFGL pump, 6gpm, 70PSI, 3600rpm, mcc	017030097*

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
44	555-1	Fog foam and AFFF	
		Valve DPHRM CONT, plt oper, 1.00IPS, 150PSI	882191594
		Extinguisher × accy CO_2, 15lb	2-930054004
		Valve DPHRM CONT, plt oper, 2.50IPS, 150PSI	882191528
		CO_2 cylinders fxd, CO_2 sys	2-930054056
		Proportioner folq, 60/180gpm	640020009
80	561-1	Steering system	
		Steering gear, ELHYD ram ty	600250061
		Steering gear, ELHYD ram ty	600230014
		Axial pstn pump, 45.4gpm, 1750rpm, 2000PSI	019160360
66	565-1	Stabilizing fins	
		Stabilizer ship, fin ty	319160005
		Stabilizer ship, fin ty	319350001
		Axial pstn pump, 6.3gpm, 1200rpm, 500PSI	019210099
		Axial pstn pump, 41.0gpm, 1200rpm, 3500PSI	019210098
84	571-1	Replenishment-at-sea winches	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
42	573-1	Cargo handling elevators	
		Davit boat, TRWA, sgl bank	560010207
		Davit boat, TRWA, sgl bank	560010206
		Winch elec	620890078
		Conveyor vert tray, 851bs cap @56fpm	590390026
		Cylinder act lin	853160310
		Davit boat, TRWA, sgl bank	560010204
78	581-1	Anchor handling and stowage	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
103	583-1	Boat handling and stowage	
		Burden reported at system level.	None

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
23	583-3	Small boats	
		Engine dsl 6, 250hp, 2300rpm	666010297
		Engine dsl 6, 250hp, 2300rpm	666010147
		Engine dsl 6, 230hp, 2300rpm	666010146
		Engine dsl 4, 4.107	664070001*
		Boat pers, 26ft, Mk3	720100079
101	593-1	Sanitary waste	
		Burden reported at system level.	None
28	611-1	Hull fittings	
		Burden reported at system level.	None
73	613-1	Rigging and canvas	
		Burden reported at system level.	None
65	622-1	Floor plates and gratings	
		Burden reported at system level.	None
35	634-1	Deck covering	
		Burden reported at system level.	None
62	635-1	Hull insulation	
		Burden reported at system level.	None
37	651-1	Commissary spaces	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
40	654-1	Utility spaces	
		Burden reported at system level.	None
32	660-1	Working spaces	
		Burden reported at system level.	None

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-3. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
31	665-1	HM&E workshops	
		Burden reported at system level.	None
22	670-1	Non-cargo stowage spaces	
		Burden reported at system level.	None
15	711-1	Guns and mounts	
		Mk1, Mod8, housing, 5in	006020151
		Fuze setter, Mk17, Mod all	006020157*
		Slide, Mk24, Mod all	006020165
		Gear, elev & trn, Mk6, Mod all	006020167
		Mk12, Mod1, barrel gun, 5in-38cal	006020161
7	721-1	Missile launching systems	
		Mk123, Mod0, launcher, guided missile	004020071
		Mk9, Mod0, magazine, guided missile	004020072
		Mk7, Mod2, guide, launcher	005020021
19	722-2	Missile handling and stowage	
		Surface vessel torpedo launcher, Mk32, Mod5&7	006320222
		Hoist chn, air oper, 10001bs cap	5[illegible]0540021
		Mk42, Mod0T2, truck handlift u/w ASROC msl	005030008
87	772-1	Ammunition cargo handling and stowage	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
86	830-1	Design services	
		Burden reported at system level.	None
72	843-1	Tests	
		Burden reported at system level.	None
38	993-3	Care and preservation	
		Burden reported at system level.	None

*Data were reported, but installation of this equipment on FFG-1 Class ships could not be positively confirmed in the COSAL.

Table A-4. FF-1040 CLASS MAINTENANCE-CRITICAL EQUIPMENTS

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
87	110-1	Underwater body hull	
		Burden reported at system level.	None
88	120-1	Hull structural bulkheads	
		Burden reported at system level.	None
79	123-1	Tanks	
		Burden reported at system level.	None
90	150-1	Deck house structure	
		Burden reported at system level.	None
84	165-1	Sonar domes	
		Sonar dome rubber window	316330001
		Water control system, sonar dome	316330004
		Valve RLF press, 3.00IPS, 18T, 32PSI	882112742
		Valve RLF, 1.00IPS, 151T, 180PSI	883112531
		Valve CHK SWG, 2.50IPS, 250PSI	882032745
24	167-1	Structural closures	
		Burden reported at system level. Maintenance not reported at system level was reported against the following equipment APL:	
		Door MRN, 26in × 66in, 3dog	312090001
1	221-1	Propulsion boilers	
		Boiler stm mn, 1300PSI	021550081
		Boiler stm mn, 1300PSI	021550090
		Boiler stm mn, 1300PSI	021550083*
		Boiler stm mn, 1300PSI	021550089*
		Supercharger CTFGL, bor	053010004
		Supercharger CTFGL, bor	053010003
		Burner oil, press ATMG, 40001bs, 14.437in BBL	300080100
		Valve Y, 1.50IPS, 1500PSI	882010223
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	221-1 (cont)	Valve RLF, bor sfty, 2.50IPS, 1315T, 1365PSI	882170304
		Indicator sgt liq, 18in LH, 33.125 in CTR to CTR	450030024
		Valve Y, 1.50IPS, 1500PSI	882010589
		Valve GLB, .75IPS, 1500PSI	882051810
		Valve gate, 2.50IPS, 1500PSI	887045194*
		Valve DPHRM CONT, plt oper, 2.00IPS, 1500PSI	882190899
		Valve GLB, .50IPS, 600PSI	882054864*
		Valve RLF, 1.00IPS, 459T, 557PSI	883111650
50	231-1	Propulsion steam turbines	
		Turbine stm mn HIP,7889rpm, 17100shp	051800344
		Turbine stm mn LP	051800346
		Turbine stm mn HIP, 7889rpm, 17100shp	051800351
		Fan CTFGL GLD exh, 10cfm	400060417
		Turbine stm mn LP, 38rpm, 35000shp	051260781
		Valve RLF, .50IPS, 100PSI	883112687
		Turbine stm mn HP, 50rpm, 35000shp	051260778
75	241-1	Propulsion reduction gears	
		Gear assy, SPD decr	691980149
		Motor ac, 440V, 3hp, 1620rpm	174802382
80	243-1	Propulsion shafting	
		Bearing assy ln shft, INBD	371010171
		Seal PLN encsd	831000090
		Stuffing box	831000135
		Stuffing box	831000130
97	251-1	Combustion air system	
		Rty pwr pump, 30.0gpm, 30PSI, 3500rpm	016160509
		Supercharger CTFGL, bor mdl 18AT11-2	053010004
		Motor ac, 440V, 30hp, 1760rpm	174801836

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
89	252-1	Automatic propulsion controls	
		Control system, comb × FD WTR	619510093
		Valve GLB, .50IPS, 1500PSI	882051966
		Control vl FO, lin, 600PSI	619040093*
		Motor ac, 440V, 25hp, 1175rpm	174751114
12	253-1	Main steam piping	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
91	254-1	Main condensers and air ejectors	
		Condenser stm mn, 600sqft, 3892TB	040090098
		Condenser stm aux, 54.8sqft, 100TB	040010019
		Condenser stm mn, 535sqft, 3890TB	040150078
		Ejector assembly, 120PSI, 2NZL, 2stg	730750066
		Ejector assembly, 120PSI, 2NZL, 2stg	130200082
		Valve RLF, 2.00IPS, 18T, 32PSI	883112451
3	255-1	Feed and condensate	
		CTFGL pump, 590gpm, 1380PSI, 6650rpm, TD	016031402
		Turbine stm mn, FD pmp	057300045
		CTFGL pump, 590gpm, 1450PSI, 7500rpm, TD	017020027
		Cooler FD, 1.15sqft, clg sur, ty B	030350001
		CTFGL pump, 630gpm, 65PSI, 1745rpm, MD	016210189
		CTFGL pump, 320gpm, 60PSI, 1160rpm, MD	016210191
		Heater deaerating, 254730 lbs/hr cap	074240031
		Turbine stm mn, pmp	057260193
		Valve GLB, 4.00IPS, 900PSI	882053683
		Cooler FD, 9.50sqft, clg sur, 130TB, ty A	030300063
		CTFGL pump, 100 gpm, 50PSI, 3470rpm, mcc	016210193
		Filter fdpress, mdl D3W18774	480020163
		Coupling flex, 10in, brz, 50PSI	990990262
		Vacuum pump, rty pwr, 10.0cfm, 3500rpm	017070120
		CTFGL pump, 630gpm, 65PSI, 1170rpm, MD	016000417
		CTFGL pump, 320gpm, 60PSI, 1150rpm, MD	016031405
		Valve RLF, 4.00IPS, 20T, 24PSI	883112582
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	255-1 (cont)	Cooler FD, 1.06sqft, clg sur, 1C, ty 1	030010122
		Motor ac, 440V, 40hp, 1745rpm	174802650
		Valve GLB, .75IPS, 1500PSI	882054364
		Valve RLF, 3.00IPS, 2T1	882110071
51	256-1	Circulating and cooling SW system	
		CTFGL pump, 320gpm, 60PSI, 1160rpm, MD	016210191
		Turbine stm mn, circ pump	057950087
		CTFGL pump, 900gpm, 125PSI, 3550rpm	016020765*
		Valve red, 4.00IPS, 150PSI, 60PSI	882094026
		Valve RLF, 1.00IPS, 32PSI	882117277
		Valve CHK SWG, 32.00IPS, 30PSI	882032814
		CTFGL pump, 13500gpm, 14PSI, 1100rpm	016031399
		Valve gate, 24.00IPS, 30PSI	882043841
27	258-1	HP steam drain system	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
16	261-1	Fuel oil service	
		Rty pwr pump, 25.0gpm, 590PSI, 1750rpm	016160460
		Valve gate, 6.00IPS, 150IPS	882044666
		Valve RLF, .50IPS, 702PSI	883113233
		Motor ac, 440V, 20hp, 1800rpm	174342032
		Strainer dplx, 1.500in	754960010
		Strainer dplx, 1.500in	754960069
		Control vl FO, lin, 600PSI	619040093*
		Valve RLF, .50IPS, 677PSI	887115127
		Gage, liq qty	450060108
		Burner oil press atmg, 40001bs, 14.437in	300080100
		Receiver assy, 150PSI	990200007
33	262-1	Main lube oil piping	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
5	311-1	SSTGs	
		Turbine stm generator	057800169
		CTFGL pump, 15gpm, 70PSI, 3435rpm	016210199
		CTFGL pump	016110271
		Turbine stm gen, 500kW	057260191
		CTFGL pump, 550gpm, 15PSI, 1750rpm	016110337
		Valve temp regg., 2.5IPS, set 159	882141613
		Valve RLF, 1.0IPS, 18T, 32PSI	882117277
		Motor ac, 440V, 7.5hp, 1770rpm	174802374
		Regulator V, WZN-1, 760D842	422040159
		Generator ac, 450V, 500kW, 1200rpm	162900152
		Motor ac, 440V, 5hp, 3435rpm	174802634
		Valve RLF, 2.0IPS, 15T, 25PSI	883112326
105	311-4	Ship service power generation	
		Burden reported at system level.	None
59	312-1	Emergency generator sets	
		Dsl engine 10, 716hp, 1200rpm	665360216
		Dsl engine 8, 706hp, 835rpm	665360215
		Motor ac, 440V, 7.5hp, 3515rpm	174751418
		Dsl engine 10, 716hp, 1200rpm	665360218
		CTFGL pump, 250gpm, 25PSI, 3515rpm	016210186
68	314-1	Power conversion equipment	
		Motor generator 440Vac, 450Vac, 30kW	181240036
		Motor generator 440Vac, 50hp, 450Vac 30kW	181240030
		Power supply, 440Vac, 26-32Vdc, 12.5kW	111610019
		Regulator freq., DRGFA4-02-1	420310023
		Power supply, 440Vac, 28Vdc, 300amp	111500008
		Power supply, 440Vac, 28Vdc, 300amp	111550040
54	320-1	Power cable	
		Switching unit pwr TFR, ABT A3, 300amp, 3ph, 440V	211110008
		Fuse box	999970243
		Terminal box shpbd pwr, ty C-73A	999970094
		Cable assy, triple outlet ac	2-620014077

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
66	320-2	Switchgear and panels	
		Switchboard pwr sserv mn, 3S	220500525
		Switchboard pwr sserv mn, 2S	220500524
		Panel test electrical	509990150
		Circuit breaker	140301303
		Switchboard pwr sserv, 400Hz	220500523
		Panel test electrical, IC, 9000-S6508-73677	509990146
		Switchboard, IC	220510080
		Switchboard, IC	220510083
47	330-1	Lighting	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
62	411-1	Tactical data displays	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
81	412-1	Tactical data processing	
		CV-2036(V)/USQ-20(V), converter digital	62762811
		AN/UYK-20X(V), data processing set (60Hz)	58735726CL
15	421-1	Nonelectric/electronic navigation aids	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
46	423-1	Electronic navigation	
		AN/SRN-15 beacon-transponder set	57130213
		AN/SRN-12 w/o OS-198/SRN-12	57129101
		AN/SRN-15A, beacon-transponder set	57130211
		AN/SRN-19(V)2, navigation set	57130128
86	424-1	Depth sounding equipment	
		AN/UQN-16, sounding set	58413635
		AN/UQN-1H, sounding set	58413640

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
37	426-1	Gyrocompass	
		Compass gyro, Mk19, Mod3A	252360019
		Compass gyro, Mk19, Mod3C	252360028
		Panel CONT	252760063
		Amplifier synch SNL, Mk31, Mod8A	253830008
		Amplifier synch SNL, Mk31, Mod8B	253830024
		Motor generator, 120Vdc, 115Vac	252560013
		Amplifier synch SNL, Mk31, Mod7	253840048
		Amplifier synch SNL, Mk7, Mod7A	253840005
		Indicator scou, Mk2, Mod2	253050016
		Power supply stnby	259390001
		Amplifier synch SNL, Mk31, Mod7	253840026
		Amplifier synch SNL, Mk31, Mod7	253840030
		Compass gyro, Mk18, Mod4C	252360015*
		Indicator scou, Mk3, Mod6	253160068
21	426-2	Electrical navigation	
		Plotting table, MkNC2, Mod0	280170001
		Indicator DRA, Mk9, Mod4	282170001
		Indicator transmitter, UWTR log	870090015*
		Plotting table, MkNC2, Mod1	287810001
		Plotting table, MkNC2, Mod2	282130001
		Tracer dr, Mk6D4A	282100001
		Indicator transmitter, UWTR log	870090006
36	432-1	Telephone systems	
		Relay ac × dc, 2pole, 2.0amp, timing	199020004
		AM-2210B/WTC, amplifier, audio freq.	52221010
		AM-2210G/WTC, amplifier, audio freq.	52221019
		H-200/U, headset	67190000
		IC-D	61595220PR*
48	433-1	Announcing systems	
		LS-386A/SIC, intercommunication station	72748605
		AM-4453/U, amplifier, speaker	52502400
		LS-458/SIC, intercommunication station	72754458
		AM-2316A/SIA, amplifier assembly	52231601

(continued)

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	433-1 (cont)	AN/SIA-120, amplifier-control group	56905000
		AN/SIA-114A, amplifier-oscillator group	56904905
56	434-1	Audio-visual equipment	
		Projector SMP, 16mm	261050020
		AN/UNQ-7D, recorder-reproducer set	58228920
		Projector SMP, 16mm	261050012
		Terminal box, telcomm, ty 6TB10C-2	999970022
		Projector SMP, 16mm	261850011
		Projector SMP, 16mm, mdl 1585ML or 1545ML	2-850004011
		C-1907/WIH, control, ships entertainment sys	61190700
		C-3766A/WIH, control, recorder-reproducer	61376605
70	436-1	Alarm, safety, and warning	
		Switch wtr, ty PP	219990176
		Switchboard alm shpbd, 10ckt	229990012
		Switch FLO, IC/RL-1-U	219990613
		Panel ind sal	381050015
		Terminal box telcomm, ty 6TB24C-2	999970023
		Switchboard alm shpbd, 30ckt ac	229990009
		Meter fdfl ind diff press, mdl 385/888	450100872
44	437-1	Indicating, order, and metering	
		C-3766A/WIH, control, recorder-reproducer	61376605
		Cell cnd, ty sal	381050120
		Panel ind sal	381040046
		Indicator transmitter	271080197
45	440-2	Satellite communications	
		AN/SSR-1, SATCOM, fleet broadcast sys	57191299CL
		AS-301B/WSC-1(V), antenna	59129526
		AN/WSC-3(V), satellite communication set	59011020CL
		OE-82C/WSC-1, antenna group	78185615CL
96	440-3	Quality monitoring and control	
		TT-624(V)5/UG, mdl 219325-1 teleprinter	92818120
		R-1051B/URR, receiver radio	81095102
		AN/URQ-10, standard freq	58532400

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
78	440-4	Message processing distribution systems	
		TSEC/KG-40 (parallel)	92600235*
		AN/SQS-54B, spectrum analyzer set	57093591
63	441-1	Communication antenna systems	
		66046, Fcl, whip antenna	06604700
		AS-2537/SR	59309931
100	441-2	Antennas -- multicouplers & tuners	
		Burden reported at system level.	None
22	441-3	Communication transmitters	
		AN/URT-23(V), transmitting set, radio	58557823CL
		AN/URT-23A(V), transmitting set, radio	58557800CL
		AN/URT-24A, transmitting set, radio	58557835CL
14	441-4	Communication receivers	
		R-1051/URR, receiver radio	81095100
		R-390A/URR, receiver radio	81039001
		AN/SRR-19A, receiving set	57141318
		AN/SRA-56, antenna coupler group	57102356
		AN/URA-38A, antenna coupler group	58433801
		AN/SRA-33, coupler group, antenna	57102300
		AN/SRR-19B, receiving set, radio	57141318SA
		AN/WRR-3A, receiving set, radio	59005301
		AN/SRA-34(V), antenna coupler group	57102334CL
		AN/URR-27A, receiver VHF	58535105
9	441-5	Communication transceivers	
		AN/URC-9, radio set	58439716
		AN/SRC-20, radio set	57112000
		AN/SRC-21, radio set	57112100
		AN/VRC-46, radio set	58841200
		AN/URC-80(V)5, radio set	58446701
		AN/PRC-41, radio set	56617700

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
67	441-6	Remote communication devices	
		C-1207A/UR, control radio set	61120705
		C-1138B/UR, control radio set	61113810
		AN/URQ-10A, standard freq	58532405
		AN/URQ-10, standard freq	58532400
		AN/SQS-54B, spectrum analyzer set	57093591
102	442-1	Underwater communication systems	
		AN/WQC-2 communication set, sonar	58992422
85	443-1	Visual and audible communication systems	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
19	445-1	Teletype and facsimile	
		AN/UGC-25A, teletypewriter radio set	58139025
		AN/UGC-6K, printer, TTY page	58138242
		AN/URA-17, comparator-converter group	58431600
		AN/UGC-26, teletypewriter set	58139050
		AN/UGC-25, teletypewriter radio set	58139036
		AN/UGC-6F, printer, TTY page	58138230
		AN/UGC-20A, teletypewriter radio set	58139029
		AN/UGC-6J; printer, TTY page	58138241
		AN/UGC-20B, teletypewriter radio set	58139038
49	446-1	Security equipment	
		KWR-37/TSEC	92601290
		TSEC/KW-7 ser 1 up	92601500
		TSEC/KY-8 man	91950800
		TSEC/KW-7 ser 25001 up	92601402
		TSEC/KG-40 (parallel)	92600235*
32	450-1	Radar distribution systems	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
53	451-X	Surface search radar	
		AN/SPS-10F, radar set	57036630
		90073-LN-66, 36mi range radar	37391404
23	452-X	2D air search radar	
		AN/SPS-40D, radar set	57039665
		AN/SPS-40, radar set	57039620
60	455-1	IFF	
		AN/UPX-11, interrogator set	58393100
		AN/UPM-137A	58286940
		AN/UPX-11, Fc-4	58393101*
		AS-177B/UPX, antenna	59153506
		AN/UPM-98A, test set, radar	58289801
		AN/UPX-17, transponder set	58393700
		AN/APX-72A, transponder set	53482572CA
		AN/UPA-24C, decoder group	58254015*
2	460-X	Sonar systems	
		AN/SQS-25AXR, detecting-ranging set, sonar	57091608
		AN/SQS-26BX, detecting-ranging set, sonar	57091610
		AN/SQR-15, towed array surveillance sys	57084803XA
		LAPS, ser 23-66, power supply	32523001PA
		AN/SQS-26BX, Fc-14	57091633
		Strainer dplx, 2.50in	750080114
		25230-G2900-100, power supply	32523002
		LAPS, ser 1-22, power supply	32523000*
104	462-1	Passive sonar	
		Burden reported at system level.	None
94	465-1	Bathythermograph	
		Winch elec, 1200lbs max cap	620420055

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
61	471-1	Active ECM	
		AN/ULQ-6B, countermeasures set	58158610
		AN/ULQ-6A, countermeasures set	58158605
28	472-1	Passive ECM	
		AN/WLR-1G, receiving set, ECM	58981705
		AN/WLR-1C, with transistorized tuner	58981717*
		AS-899A/SLR, antenna DF	59189905
		AN/SLA-12, antenna group	56935912*
		AS-616A/SLR, antenna	59161601
		AS-899C/SLR, antenna receiver assembly	59189906
		AN/WLR-3, receiving set, ECM	58981900
			58189900
			58981728
93	473-1	Torpedo decoys	
		Winch elec, 2dm, 5000lbs max cap @100fpm	620420225
		Motor ac, 440V, 5hp, 1560rpm	174751497
92	475-1	Degaussing	
		Switchboard degusg, C704390008	227020001*
		Switchboard degusg, C704390008	940100012
		Charger battery, 5amp	090950001
		Panel degusg pwr sup, FIQI-C-C704390010	940100007
		Panel degusg pwr sup, M-C-C704390009	940100006
99	480-3	Testing, antisubmarine warfare intra-system	
		Test set, elec sys msl Mk363, M1x3	005020022
		Mk6, Mod 1, director dummy	006020524
7	481-X	Gun fire control systems	
		Director, gun, Mk56, M7&9	49402624
		Computer, Mk42, Mod6	49402604
		Computer, Mk1A, M5 with ORDALT 3658	49400370
		Mk35, Mod2, radar equipment	49402600
		Elev-train, amp mot-gen for gun dir, Mk56, M3,6,7,&8	49402678
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	481-X (cont)	ORDALT 5901A, radar signal process, eqpt Mk1, M3	78650190*
		Mk28, Mod9, panel control	49402643
		Console, Mk4, M9&17	49402657
		Mk27, Mod9, panel control	49402626
		Director gun, Mk56, M7&8	49402624
98	482-X	Missile fire control systems	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
42	483-X	ASW fire control systems	
		Mk53, Mod0, console attack	005000002
		Mk44, Mod1, transmitter relay	005000019
10	491-1	Electronics test, checkout and monitoring equipment	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following APLs:	
		55026-260-6XLP, multimeter	35502622
		AN/USM-116A, multimeter, electronic	58614205*
		AN/USM-207A, counter, electronic digital	58627022
		AN/USM-115, calibrator set, range	58614100
		AN/USM-281E, oscilloscope	58617040
		60086, multimeter	06008600
83	492-1	Flight deck lighting	
		Light, navigation	249990237*
25	511-1	Heating systems	
		Boiler stm aux, 155PSI, 40001bs/hr cap	022050020
		Boiler stm aux, 155PSI, 40001bs/hr cap	022050019
		CTFGL pump, 3gpm, 125PSI, 1750rpm	016110334
		Valve RLF, 1.00IPS, 1151T, 275PSI	882116897
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	511-1 (cont)	Rty pwr pump, 2.86gpm, 1800rpm	017210055
		CTFGL pump, 15gpm, 58PSI, 3480rpm	016210197
		CTFGL pump, 30gpm, 58PSI, 1715rpm	016210192
		Boiler stm aux, 100PSI, 8001bs/hr cap	022050016*
31	512-1	Non-machinery ventilation	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None
11	514-1	Chilled water cooling distribution	
		Compressor RFG, ty V	060150113
		Refrigeration plant, 24ton cap	325000227
		CTFGL pump, 75gpm, 60PSI, 3480rpm	016210183
		Condenser, RFG wtr, 90gpm cap	043010117
		Air conditioner	330190092*
		Motor ac, 440V, 30hp, 1760rpm	174801836
		Refrigeration plant, 24ton cap	325010211
		Air conditioner, mdl SACFS60S12	330400002
		Air conditioner, mdl MCMAC7, 1-2	330190084
		Motor ac, 440V, 30hp, 1760rpm	174802603
		Compressor RFG, vert opn	060150112
		Air conditioner, mdl NC33D440EP	330340012
		CTFGL pump	016110271
		CTFGL pump, 75gpm, 60PSI, 3500rpm	016110270
		Motor ac, 115V, 5hp, 3450rpm	174700047
38	516-1	Ships service refrigeration	
		Refrigeration system, food sto, 4ton cap	325000226
		Compressor RFG, vert opn	060150118
		Motor ac, 440V, 30hp, 1760rpm	174801836
		Condenser RFG wtr CLO, 26gpm cap	043010137
		Refrigeration system, food sto, 1.80ton cap	325010215
		Conveyor vert, tray ty, 851bs cap @56fpm	590390020* 17470265

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
4	520-1/ 521-1	Sea valves/fire and flushing	
		CTFGL pump, 900gpm, 125PSI, 1775rpm	016210195
		Valve cont SPCL, .37IPS, 250PSI	882240204
		Valve pneum rel, .375IPS	882240028
		Valve gate, 2.50IPS, 250PSI	882043975
		Motor ac, 440V, 100hp, 1775rpm	174802651
		CTFGL pump, 250gpm, 250PSI, 3500rpm	016050231
		Valve GLB, 1.00IPS, 200PSI	882241238
		CTFGL pump, 250gpm, 25PSI, 3515rpm	016210186
		CTFGL pump, 900gpm, 125PSI, 3550rpm	016020765*
		CTFGL pump, 900gpm, 125PSI, 1775rpm	016210324
		Motor ac, 440V, 100hp, 3570rpm	174030910*
		CTFGL pump, 100gpm, 30PSI, 1750rpm	017000043
		CTFGL pump, 900gpm, 125PSI, 1775rpm	016210195
		Heat sensing device, 158°F	889900796
		CTFGL pump, 250gpm, 100PSI, 4500rpm	019430001
		Valve GLB, 1.50IPS, 250PSI	882051262
		Valve gate, 5.00IPS, 250PSI	882041003
		Strainer dplx, 2.50in	754960023
		Valve LFT, CHK GLB SPCL, .37IPS, 250PSI	882240169
		Valve CHK SWG, 6.00IPS, 250PSI	882032749
		Valve gate, 5.00IPS, 250PSI	882042020
		Valve gate, 8.00IPS, 150PSI	882044076
		Valve RLF, 5.00IPS, 48T, 60PSI	883113226
		Controller ac	151205928
64	528-1	Plumbing drains	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APLs:	
		Pump, prtl sbmrbl, 5hp, 440Vac, 180gpm	017710005
		Valve DPHRM, CONT plt oper, 2.0IPS, 150PSI	882190820
		Compensating control box, degaussing, ty A-1	280000151

*Data were reported but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
17	531-1	Distilling plants	
		Distillation unit, 8000gpd, 472sqft	080030019
		Motor ac, 440V, 1.5hp, 3520rpm	174751264
		CTFGL pump, 125gpm, 35PSI, 3450rpm	016210185
		Distillation unit, 8000gpd, 398 TB	080100020
		CTFGL pump, 10gpm, 35PSI, 3500rpm	017030047
		CTFGL pump, 148gpm, 28PSI, 1750rpm	017030169
		CTFGL pump, 125gpm, 28PSI, 1750rpm	017030104
		Motor ac, 440V, 5hp, 3450rpm	174802373
		CTFGL pump, 148gpm, 28PSI, 1750rpm	017030105
		CTFGL pump, 4gpm, 50PSI, 3550rpm	016020791
		Motor ac, 440V, 7.5hp, 1740rpm	174751574
		CTFGL pump, 7gpm, 35PSI, 3550rpm	016020792
		Ejector assembly, 110PSI, 2stg	730060017
		Valve RLF, 2.5IPS, 19PSI	883110187
18	533-1	Potable water service	
		CTFGL pump, 40gpm, 50PSI, 3515rpm	016210196
		CTFGL pump, 155gpm, 100PSI, 3515rpm	016210187
		Motor ac, 440V, 5hp, 3515rpm	174802663
		Rty pwr, vacuum pump, 10.0cfm, 3500rpm	017070120
		Valve gate, 2.50IPS, 100PSI	882040812
		Cooler FD, 58.00sqft, ty A	030010161
		Heater, stm htg	074690005
		Cooler FD, 50.30sqft, ty A	030010193
		Demineralizer, pure wtr sys	080150006
		Valve DPHRM cont, plt oper, .75IPS, 150PSI	882190871
		Cooling coil	326990025
		Heater wtr insts, 40.00gpm max	074100017
		Cooler fl, 1200sqft, ty A	030130797
69	541-1	Fuel and fuel compensating system	
		Valve GLB, .25IPS, 800PSI	882054356
		Valve gate, .800IPS, 150PSI	882045364
		Valve ANL, 2.50IPS, 100PSI	882002186
		Control trmt, tk lvl	616330008
103	542-3	MOGAS handling and piping	
		Nitrogen charging cart	2-920014190

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
57	543-1	Aviation and general purpose lube oil system	
		Rty pwr pump, 50gpm, 50PSI, 520rpm	016200169
		Motor ac, 440V, 3hp, 1730rpm	174751113
		Filter	480030133
		Valve RLF, 4.00IPS, 7PSI	883113232
		Valve DPHRM cont, plt oper, 2.00IPS, 150PSI	882190820
		Valve RLF, 1.50IPS, 68PSI	883113238
		Rty pwr pump, 50gpm, 50PSI, 520rpm	016200163
		Valve gate, 2.00IPS, 200PSI	882041814
101	545-1	Tank heating	
		Valve RLF, 5.00IPS, 51T, 70PSI	883112968
		Valve RLF, 1.00IPS, 36T, 80PSI	883112337*
		Valve RLF, .50IPS, 55T, 65PSI	883112328
6	551-1	HP air system	
		Compressor air HIP, 7.5cfh, 3000PSI	061900210
		Compressor air LP, 100cfm, 125PSI	061900359
		Compressor CTFGL, 1400cfm, 25PSI	061900219
		Compressor air LP, 100cfm, 150PSI	061900194*
		Valve RLF, .50X, .75IPS, 116T, 150PSI	883112214
		Valve RLF, .75IPS, .35T, 44PSI	883114901
		Dehydrator fltr dscc, 30scfm, 150PSIG	440360004
58	551-4	Prairie masker air system	
		Compressor CTFGL, 1400cfm, 25.0PSI, lstg	061900211
		Compressor CTFGL, 1400cfm, 25.0PSI, lstg	061900282
		Panel, ind sal	381040051
		Panel, ind sal	057260189
55	555-1	Fog foam and AFFF	
		Engine gas, 2, P-250 pmp eng, 25hp, 4200rpm	668500008
		Proportioner folq, 60/180gpm	640020005
		Reeling machine hose, hnd oper	550490005
		Valve gate, 5.00IPS, 150PSI	882045798
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	555-1 (cont)	Extinguisher × accy, CO_2, 15lb	2-930054003
		Valve DPHRM CONT, plt oper, 1.00IPS, 150PSI	882191594
		Valve DPHRM CONT, plt oper, 2.50IPS, 185PSI	882190593
76	561-1	Steering system	
		Steering gear, ELHYD ram ty	600230014
		Steering gear, ELHYD ram ty	600250058
		Switch rty, 2JR5-3	219990406
		Steering gear, ELHYD ram ty	600250061
71	565-1	Stabilizing fins	
		Stabilizer ship, fin ty	319160005
		Motor ac, 440V, .25hp, 1725rpm	174900107
		Motor ac, 440V, 20hp, 1080rpm	174342019
		Stabilizer ship, fin ty	319350001
73	571-1	Replenishment-at-sea winches	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APL:	
		Conveyor vert tray ty, 851bs cap @56fpm	590390070
34	573-1	Cargo handling elevators	
		Davits boat, TRWA sgl bank	560270001
		Conveyor vert tray, 851bs cap @56fpm	590390026
		Winch elec, 2dm, gyp max	620890078
		Davits boat, TRWA sgl bank	560010192*
		Davits boat, TRWA sg bank	560010204
		Davits boat, TRWA sgl bank	560270002
			2820374009
74	581-1	Anchor handling and stowage	
		Chain anchor & appendage, 1-1/2in	2-260014277
		Windlass elec, 1.500in, stud link	630250014

(continued)

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	581-1 (cont)	Chain anchor & appendage, 1-1/2in	2-260014126
		CTFGL pump, 155gpm, 76PSI, 3515rpm	016210198
		Controller ac, mag lvr, SZ3, 440V	151205395
		Capstan elec, 2spd, max pull 10000 @60fpm	530180017
		Accessories & tools, mooring	2-260034080
95	583-2	Life-saving equipment	
		Lifeboat IFL, CO_2, Mk5	2-820374009
13	583-3	Small boats	
		Dsl engine 6, 250hp, 2300rpm	666010147
		Dsl engine 4, 250hp, 2400rpm	667770002
		Boat pers., 26ft, Mk3	720100079
		Wholeboat mtr, 26ft, Mk10	720110026
		Boat pers., 24ft, Mk4	720100025*
		Dsl engine 4, 4.107hp	664070001
106	593-1	Sanitary waste	
		Burden reported at system level.	None
29	611-1	Hull fittings	
		Burden reported at system level.	None
77	613-1	Rigging and canvas	
		Burden reported at system level.	None
65	622-1	Floor plates and gratings	
		Burden reported at system level.	None
52	634-1	Deck covering	
		Burden reported at system level.	None
26	651-1	Commissary spaces	
		Burden distributed among all equipments; no single equipment accounted for a significant percentage of system burden.	None

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
40	654-1	Utility spaces	
		Burden reported at system level.	None
43	660-1	Working spaces	
		Burden reported at system level.	None
35	665-1	HM&E workshops	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APL:	None
		Cell, CNDTV sal	381050121
20	670-1	Non-cargo stowage spaces	
		Burden reported at system level.	None
8	711-1	Guns and mounts	
		Mk1, Mod8, housing, 5in	006020151
		Mk12, Mod1, barrel gun, 5in-38cal	006020161
		Gear elev & trn, Mk6, Mod all	006020167
		Hoist prjt, Mk2, Mod all	006020172
		Carriage, Mk25, Mod all	006020164
		Slide, Mk24, Mod all	006020165
		Wiper wnd, Mk2x3, Mod all	006020162
30	721-1	Missile launching systems	
		Mk7, Mod2, guide launcher	005020021
		Mk7, Mod1, carriage launcher	005020001*
		Mk7, Mod4, carriage launcher	005020017
		Mk3, Mod1, attachment window wiper	006020162
		Mk199, Mod3, panel launcher captains control	005020013
39	722-2	Missile handling and stowage	
		Surface vessel torpedo launcher Mk32, Mod5&7	006320222
		(continued)	

*Data were reported, but installation of this equipment on FF-1040 Class ships could not be positively confirmed in the COSAL.

(continued)

Table A-4. (continued)

MBF Rank	SWAB	System/Equipment Nomenclature	Equipment APL or AEL
	722-2 (cont)	Crane, ASROC loader Mk16, Mod4T8, launching group, tools	572130001 0-005020004
82	772-1	Ammunition cargo handling and stowage	
		Hoist ammo, ELHYD auto, 5in-38cal	580040063
41	993-3	Care and preservation	
		Burden reported at system level.	None
72	ORD-1	Expendable ordance (missiles, mines, torpedoes)	
		Burden reported primarily at system level. Maintenance not reported at system level was reported against the following equipment APL:	
		Torpedo Mk46, Mod1&2, common items	006300326


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